NORTHERN SCIENTIFIC TRAINING PROGRAM

PROGRAMME de FORMATION SCIENTIFIQUE dans le NORD

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FOREWORD

The annotated bibliography is produced on a bi-annual basis. This is the fourteenth annotated bibliography based on research which has been fully or partly funded by the Northern Scientific Training Program (NSTP). It is a combination of 2001-2002 and 2002-2003 research years.

Its aim is to provide a perspective on the range of research projects supported by the NSTP, and is designed to promote the exchange of information and collaboration among academics, northern experts and northern communities. Moreover, it demonstrates the significance of northern scholarship resulting from the Program.

The preparation of this bibliography has resulted from the collective efforts of Samantha Tenasco and Karli Bergquist and Rhonda Turner for her overall coordination of the project.

AVANT-PROPOS

La bibliographie annotée est produite tous les deux ans. Il s'agit de la quatorzième bibliographie annotée recueillant des travaux de recherche financée en totalité ou en partie par le Programme de formation Scientifique dans le Nord (PFSN). Elle porte sur les travaux réalisés en 2001-2002 et 2002-2003.

Nous la publions afin de montrer l'étendue des travaux subventionnés par le PFSN et de favoriser l'échange d'information et la collaboration entre les universitaires, les spécialistes des questions nordiques et les collectivités du Nord. Nous désirons mettre en évidence la somme des connaissances résultant du PFSN.

Cette bibliographie fut réalisée grâce aux efforts et à la collaboration de Samantha Tenasco et Karli Bergquist, ainsi qu'à Rhonda Turner, qui en a assuré la coordination.

Russel Shearer
Secretary / Secrétaire
Northern Scientific Training Program
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INTRODUCTION

This annotated bibliography comprises the abstracts of theses, essays, reports, seminar and conference presentations, and other scientific papers based on projects supported by the NSTP. All the abstracts were submitted, published or presented in 2001 or 2002.

The information contained in this bibliography was compiled mainly from the NSTP research reports submitted by students for the 2001-2002 and 2002-2003 research years. All information was checked for accuracy through follow-ups with the participating universities.

The first two sections of the bibliography (2001 and 2002) are alphabetically organized by university and by author. The bibliographical references were completed using the following criteria: author, abstract[1], discipline and fieldwork location. The indices of the bibliography are divided into three: author, discipline and fieldwork location.

The NSTP Secretariat received submissions from 17 Canadian universities for the 2001-2002 research year, for a total of 92 bibliographical entries. During 2002-2003, abstracts were submitted by 21 universities, for a total of 90 bibliographical entries.

INTRODUCTION

Cette bibliographie analytique renferme les résumés de thèse, d'essais, de rapports, de présentations à des séminaires et à des conférences ainsi que d'articles scientifiques divers liés à des travaux entrepris dans le cadre du PFSN. Tous les résumés ont été soumis, publiés ou présentés en 2001 ou 2002.

L'information présentée est tirée surtout des rapports de recherche soumis par des étudiants en 2001-2002 et 2002-2003. Les données ont fait l'objet d'une recherche documentaire puis d'un suivi auprès des universités concernées pour en assurer l'exactitude.

Les deux premières sections de la bibliographie (2001 and 2002) sont présentées par ordre alphabétique selon l'université et l'auteur. Les références bibliographiques renferment les éléments suivants : auteur, résumé[1], discipline et lieu des travaux sur le terrain. Les index sont divisés en trois parties : auteur, discipline et lieu du travail sur le terrain.

En 2001-2002, le Secrétariat du PFSN a reçu des soumissions de 17 universités, qui ont donné lieu à 92 notices bibliographiques. En 2002-2003, il a reçu des résumés de 21, qui ont donné lieu à 90 notices bibliographiques.

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[1] This symbol "←/→" was used to condense those abstracts/descriptions which were of considerable length.

[1] Nous avons parfois utilisé le symbole "←/→" pour abréger les textes qui étaient trop longs.

ANNOTATED BIBLIOGRAPHY BY UNIVERSITY 2001/ BIBLIOGRAPHIE ANNOTÉE PAR UNIVERSITÉ 2001

UNIVERSITY OF ALBERTA

01-001 **BHATIA, M., et al. (2001).** Molecular analysis of bacterial communities eneath a Canadian High Arctic polythermal glacier. Conference Paper: European Geophysical Society, American Geophysical Union, and European Union of Geoscience Joint Assembly, Nice, France, April 7, 2001.

ABSTRACT/DESCRIPTION:
The goal of this study is to characterize the bacterial communities beneath, on, and adjacent to a high Arctic polythermal glacier, with a view to understanding the origins of the subglacial population. The study site is John Evans Glacier (JEG), Ellesmere Island, Canada. JEG is a polythermal glacier consisting of a core of ice at the pressure melting point, surrounded by an outer layer of cold ice. Basal melting and seasonal inputs of meltwater from the glacier surface provide liquid water for subglacial microbial life. Samples were collected from the subglacial, supraglacial, and proglacial environments at JEG. Subglacial samples included basal ice and water that had been stored beneath the glacier. Dry snow, wet snow, and water from supraglacial streams were collected as representatives of the supraglacial environment, which changes in character though the melt season. Sediments and algal mats were collected from an area directly in from of the glacier terminus and along a transect adjacent to the glacier to reflect the developing proglacial environment. Hydrochemical analyses were conducted to assess the role of microbial activity in biogeochemical processes. To compare the bacterial communities, molecular techniques were applied to total community DNA that was released from the samples by a physical cell disruption technique. The polymerase chain reaction (PCR) was used with bacterial-specific primers, one of which was fluorescently labelled, to amplify community 16s rDNA genes. Single digestions with the restriction enzymes HaeIII and HhaI were performed to conduct inter- and intra-community comparisons of the terminal restriction fragment length polymorphisms (tRFLPs) of the fluorescently tagged amplified 16S rDNA genes. Preliminary results indicate that although some species are present throughout the different environment, several species are unique to each particular habitat. Further study of replicate tRFLP data statistical analyses will allow analysis of community richness, diversity, and origin.

DISCIPLINE: Geomicrobiology.

FIELDWORK LOCATION: John Evans Glacier, Ellesmere Island, Nunavut.

01-002 **BINGHAM, R., et al. (2001).** Dye-tracer studies of the hydrology of a high-arctic polythermal valley glacier: Implications for glacier motion. CGU-ESC Annual General Meeting, Ottawa, Ontario, May 14-17, 2001.

ABSTRACT/DESCRIPTION:
It is well recognised that the passage of water through temperate glaciers impacts significantly upon their pattern of ice dynamics. By contrast, the impact of subglacial hydrology on the dynamics of polythermal glaciers is poorly understood due in part to a dearth of relevant data. During summer

2000, field investigations were undertaken at John Evans Glacier, a polythermal valley glacier on Ellesmere Island (79°40'N, 74°00'W) to i) characterise the subglacial hydrology of the glacier and determine the extent to which it evolved over the course of a melt season, and ii) establish whether variations in subglacial hydrology affected rates of glacier motion. Known quantities of fluorescent dye were periodically injected into the englacial system via moulins and dye emergence was detected in a single stream emerging from the terminus 5km downglacier. Dye tests in late June generated highly dispersed breakthrough curves and low mean flow velocities (-0.14ms-1) indicative of inefficient distributed drainage conditions. By early August, dye transit velocities between the same nodes were fast (-0.7ms-1) and dye experienced little dispersion, indicating that the subglacial drainage had evolved into an efficient channelised system. Surface glacier motion was measured throughout the summer season using standard surveying and differential GPS techniques to monitor a network of stakes across the glacier surface. Highest horizontal velocities were observed in late June throughout the glacier in conjunction with vertical uplift at a number of stakes. We hypothesise that the surface motion variations are directly related to the seasonal evolution of the subglacial drainage system. The role of hydrology on ice dynamics in polar regions may, under certain conditions, be very similar to that recognised from temperate glaciers.

DISCIPLINE: Hydrology.

FIELDWORK LOCATION: John Evans Glacier, Nunavut.

01-003 BOON, S. and SHARP, M. (2001). Drainage system evolution of an Arctic glacier. Presentation. CRYSYS Annual Meeting, Edmonton, Alberta, February 15, 2001.

ABSTRACT/DESCRIPTION:
This paper examines the mechanisms behind meltwater release from storage in ice-marginal and supraglacial lakes, and the impact of temporal patterns of supraglacial water delivery on the seasonal evolution of subglacial drainage. Fieldwork was completed at John Evans Glacier, Ellesmere Island (JEG; 79°40'N 74°00'W) during the summer of 2000, to monitor supraglacial and proglacial stage, discharge and electrical conductivity. Results indicate that snowmelt is initially routed into storage in supraglacial lakes, remaining isolated from the rest of the drainage system. Meltwater is also routed into the supraglacial channels, which are essentially disparate ponds which interconnect at the onset of the melt season. The final pond drains into a moulin, which feeds water to the subglacial system. As the upstream ponds connect to this final pond, pulses of surficial meltwater are fed to the subglacial system. Subglacial storage thus fills to a given pressure threshold, at which point water is able to burst through a cold ice dam at the terminus and initiate proglacial drainage. The subsequent loss of hydrostatic head at the bottom of the system leads to drainage of the supraglacial lakes, initiating connections between the lakes and the supraglacial channels. Reservoir drainage also plays a role in subglacial drainage system development. The research focus has thus been expanded to create a melt-runoff model representing the behaviour of JEG and its possible response to climatic change.

DISCIPLINE: Glacier Hydrology.

FIELDWORK LOCATION: John Evans Glacier, Nunavut.

01-004 **BOON, S. and SHARP, M. (2001).** Impact of high-latitude chinook events on arctic glacier hydrology. Canadian Geophysical Union - Eastern Snow Conference Joint Annual Meeting, Program and Abstracts, Ottawa, Ontario May 14-17, 2001.

ABSTRACT/DESCRIPTION:
On 28-30 July, 2000, a chinook-type event, characterised by high air temperatures and strong winds, was observed at John Evans Glacier (JEG), Ellesmere Island (79°40'N, 74°00'W). The chinook resulted in a marked increase in surface melt rates, leading to elevated supra- and proglacial water levels and increased discharge. Given the apparent impact of this event on the hydrological system of the glacier, this paper aims to: (i) identify the synoptic conditions under which it occurred; (ii) quantify its absolute and relative impact on surface melt rates and runoff; and, (iii) evaluate the likely recurrence interval of events of this type. Synoptic charts and data from the National Center for Environmental Prediction's climate dataset indicate that the event occurred while there was a 500mb high over the Arctic Ocean and a low over Greenland that deepened and moved into Baffin Bay. This resulted in a strong east-to-west flow over the northern sector of the Greenland Ice Sheet, with descending flow on the NW side reaching Ellesmere Island. Wind speeds on JEG at 1138 m a.s.l. averaged 8.1 m s-1 over the period of the event, with peak hourly wind speeds reaching 11.6 m s-1. Air temperatures reached 8°C, and rates of surface lowering measured by an ultra-sonic depth gauge averaged 9 cm d-1. Melt rates calculated from on-site measurements of net radiation, air temperature, relative humidity and wind speed, using the energy balance model of Brock and Arnold (2000), reveal that the contribution of the event to total summer runoff was approximately 27% at 1138 m a.s.l.. The chinook occurs infrequently in this area; examination of meteorological data from Alert and Eureka indicate that the July 2000 event was highly localised, and similar events do not appear in the historical record. A search of a preliminary synoptic classification completed by Keimig (2001) also indicates that the specific synoptic conditions during the event occurred on only 2.3% of days between 1948-1999.

DISCIPLINE: Glacier Hydrometeorology.

FIELDWORK LOCATION: John Evans Glacier, Nunavut.

01-005 **BRUNGS-SIMARD, H.M. (2001).** A fire history study: Toward a community protection plan for Fort Smith, NT. M.Sc. Thesis, Department of Biology, University of Alberta, 2001.

ABSTRACT/DESCRIPTION:
In the boreal forest of northern Canada, forest fires have increased in number and size over the past decades. To support a community protection fire management plan, a fire history study was carried

out in a 595km^2 area to the south and west of Fort Smith, Northwest Territories. Estimation of time since last fire indicate four fire regimes with fire cycles of 181, 267, 29 and 130 years since 1865. Correlation of tree-ring variables with Fire Weather Index components were extremely weak, but DMC was significantly correlated to trees found in sites that experienced fluctuating moisture levels. To identify fuel corridors and break, vegetation was classified according to the Alberta Wetland Inventory and mapped.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Fort Smith, Northwest Territories.

01-006 CASTLEDEN, H. (2001). The silent North: Deafness in a Dene community. Presentation, International Congress of the Arctic Social Sciences - Fourth Conference, Laval, Québec, May 16-20, 2001.

ABSTRACT/DESCRIPTION:
This study explores a northern Dene community's response to a particular health issue: deafness. Using a case study approach, the study examines deafness from a cultural perspective rather than from a pathological framework. Through the use of interviews and observations, family, community members, leaders, and professionals explored the transitions of self and knowledge as they critically reflected on how their perceptions towards deafness reshaped their paradigms and redefined their relationships within the community. Linkages between northern communities and the health profession are needed in terms of providing culturally relevant materials, services, and resources that are responsive to each community's particular context. The implications of this research project are intended to open the channels of communication in terms of holistically addressing the health needs of northern communities, needs that have traditionally fallen on deaf ears.

DISCIPLINE: Education.

FIELDWORK LOCATION: Lutsel K'e, Northwest Territories.

01-007 DERRY, A.M., (2001). Zooplankton communities and genetic divergence of rotifers in saline and subsaline lakes. M.Sc. Thesis, University of Alberta, Edmonton, Alberta, 2001.

ABSTRACT/DESCRIPTION:
Although salinity and aquatic biodiversity are inversely related in lake water, the relationship between types of salts and zooplankton communities is poorly understood. Further, there is no information on whether variation in salt concentration contributed to the genetic divergence of zooplankton populations. In my study, lake water dominated by chloride anions had distinct zooplankton communities from those dominated bu sulphate/carbonate anions. This distinction likely resulted from the combined effects of contrasting water chemistries and predation regimes.

Greater haplotype diversity and genetic divergence was observed among populations of halophilic Brachionus plicatilis than among populations of predominantly freshwater Keratella quadrata rotifers. The most divergent B. Plicatilis population was a strain that was most abundant at lower salinities. I provide preliminary evidence for an additional sibling species in the B. Plicatilis species complex. This study documents some of the first molecular phylogenetic work conducted on rotifers.

DISCIPLINE: Life Sciences / Limnology.

FIELDWORK LOCATION: Fort McMurray, Alberta and Fort Smith, Northwest Territories.

01-008 FARFARD, M. (2001). Dechyoo Njik (MIVm-4) and the traditional land use patterns in the southwestern portion of the Old Crow Falts, Yukon Territory. Monograph: Hude Hudan Series No. 8, Heritage Branch, Yukon Governemnt, 2001.

ABSTRACT/DESCRIPTION:
This paper presents the results of the excavation and analysis of the Dechyoo Njik site (MIVm-4), a late prehistoric/historic camp located int eh southwestern portion of the Old Crow Flats area, in the Northern Yukon Territory. The major objectives of this research were to document the range of activities in the Old Crow Flats and to improve the current understanding of pre-contact/contact period land use patterns. Dechyoo Njik was used as a summer multifunctional location for the gathering of carious resources including fish, migratory waterfowl, and muskrats. The artifact collection revealed the presence of a well-integrated technological system characterized by the manufacture of simple stone tools aimed at sustaining a complex bone and antler industry. The prehistoric component of the sire is culturally affiliated with the Klo-kut Phase (from 700 AD up to the Historic Period) which was already identified at other sites in the Northern Yukon.

DISCIPLINE: Anthropology / Archaeology.

FIELDWORK LOCATION: Old Crow Flats, Yukon Territory.

01-009 FRANKEN, R. and HIK, D. (2001). Size isn't everything: The effect of patch size and isolation on pika persistence. Conference Abstracts, The Wildlife Society 8th Annual Conference, (Session 42) September 25-29, 2001 and 22nd Annual Pacific Ecology Conference, February 16-18, 2001.

ABSTRACT/DESCRIPTION:
Habitat fragmentation is considered a significant threat to biodiversity, in part, because it restricts the movement of individuals between populations. Studies have shown that without this dispersal of individuals between populations, some species will disappear. Nevertheless, many species continue to persist in a network of populations or 'metapopulation', in which small sub-populations are connected by dispersal. The focus of this project was to examine how collared pikas (*Ochotona*

collaris) persist in a naturally fragmented landscape consisting of irregular talus patches surrounded by alpine meadows. Pikas were censussed in the Ruby Ranges, Yukon from 1995 to 2000 to determine their presence or absence on talus patches. Generalized linear models (GLM) with binomial errors were used to determine the variables important in predicting the occupancy, extinction and recolonization of talus patches by pikas. Predictor variables included patch size(m), minimum patch isolation (m), year (1995-2000), season (fall/spring), patch and aspect. Although, several metapopulation models use patch size and isolation as important predictors of population stability, preliminary analysis at this site indicates that patch size and isolation can only partially explain the dynamics in this population, suggesting that perhaps habitat quality may be an important variable in predicting pika persistence.

DISCIPLINE: Ecology.

FIELDWORK LOCATION: Kluane Lake, Yukon.

01-010 HEFFNER, T. (2001). KaVn-2: An Eastern Beringian tradition archaeological site in West-Central Yukon Territory, Canada.. M.Sc. Thesis, Department of Anthropology, University of Alberta, 2001.

ABSTRACT/DESCRIPTION:

This thesis examines the archaeological and palaeoenvironmental record of the Beaver Creek area of west-central Yukon, through detailed excavation and analysis of cultural materials from KaVn-2, a later Pleistocene multi-component archaeological sire located in the Shakwak Trench, and literature review.

KaVn-2 contains evidence of initial human occupation dating to between 10,670 and 10,130 C14 years BP. The site, positioned approximately one kilometre within the maximum extent of ice during the last glaciation, became ice-free about 11,000 C14 years BP and was inhabited shortly thereafter. Later occupations span most of the Holocene.

Lithic artifacts recovered from the early component show affinities to those from other Eastern Beringian sites. Analysis of these artifacts supports the Eastern Beringian Tradition as the most suitable cultural historical scheme for organizing Late Pleistocene cultural materials. At present, artifacts derived from the later components can best be interpreted within the southwest Yukon cultural historical framework.

DISCIPLINE: Anthropology.

FIELDWORK LOCATION: Beaver Creek area, Yukon Territory.

01-011 MURRAY, G. (2001). The abundance and distribution of edible wild plants in the GSA. Poster Presentation: Sustainable Forest Management Network, Student Workshop, University of Alberta, Edmonton, Alberta, October 18-20, 2001.

ABSTRACT/DESCRIPTION:
At the northern extreme of the boreal forest, traditional forestry is not possible for many of the communities. In these areas, the development of non-timber forest products may be a viable alternative for income generation. For this study, the non-timber forest product being investigated was edible berry species within the Gwich'in Settlement Area (GSA) in the Northwest Territories. This poster will highlight some research from the past two years. During the summer of 2000 and 2001 the amount and variety of the various berries species that grow in the area, were measured in five distinct ecosystems. (←/→) These quantities were then used to get an estimate of the potential of berry production in the whole GSA. Also during these two summers, local people were interviewed and surveyed to ascertain the local use of non-timber forest products within the GSA. Gwich'in from the four communities in the GSA (Inuvik, Fort McPherson, Tsiigethchic, and Aklavik) were contacted for the interviews and surveys. The objectives were to ascertain the type of berries which the Gwich'in people collected, the various ways in which the berries collected were used, and to try and quantify the amount of berries picked.

DISCIPLINE: Economics.

FIELDWORK LOCATION: Gwich'in Settlement Area, Northwest Territories.

01-012 NIENOW, P.et al. (2001). Supraglacial drainage processes on high arctic glaciers: Implications for subglacial hydrology and glacier dynamics. Presentation, International Glaciological Society: British Branch Meeting, British Antarctic Survey, Cambridge, UK, September 13-14, 2001.

ABSTRACT/DESCRIPTION:
It is increasingly recognised that seasonal evolution of subglacial drainage systems can be driven by processes that take place in the supraglacial drainage systems that feed them. In this paper, we document some of the processes of meltwater production, storage and runoff that occur in supraglacial drainage systems on polythermal John Evans Glacier, Ellesmere Island, Canada. Our results demonstrate a seasonal evolution of the supraglacial drainage system whereby the sequence of melt, water storage, connection of storage sites and drainage into the englacial/subglacial drainage system occurred at locations increasingly further upglacier as the meltseason progressed. Once meltwaters accessed the englacial drainage system via crevasses, the drainage of large volumes of stored water resulted in the rapid evolution of the englacial/subglacial drainage system. Once fully developed, 40% of supraglacially derived meltwater was routed subglacially to the glacier snout. We suggest that the proportion of High Arctic ice masses in which a significant proportion of the supraglacially derived meltwater reaches the glacier bed has likely been underestimated. In conjunction with findings elsewhere, we conclude that supraglacial drainage plays a critical role in determining the extent of subglacial drainage fed by surface melt in High Arctic ice masses. In addition, we suggest that as the scale of an Arctic ice mass increases, so does the likelihood of supraglacially derived meltwaters reaching the glacier bed. These findings are significant due to the potential impact of subglacial drainage on ice flow dynamics, the evacuation of products of basal erosion and the hydrochemistry of glacial meltwaters.

DISCIPLINE: Hydrology.

FIELDWORK LOCATION: John Evans Glacier, Nunavut.

01-013 RUTTAN, L. (2001). Issues in shared schools in mixed aboriginal and non-aboriginal school systems. Conference Abstract: Rural Communities and Identities in the Global Millennium, Malaspina Univeristy-College, Nanaimo, British-Columbia, April 30, 2001.

ABSTRACT/DESCRIPTION:

Canada's public educational programs are essential public goods resources. In order for children to benefit parents must cooperate in efforts to support and enhance their children's education. In today's multicultural communities we see an increasingly complex mix of parent's expectations, cultural beliefs and the values and assumptions of educational systems. Differing cultural and class backgrounds impact not only parent's world view but also their specific goals for children.

Educator's note the increasing focus and concern of parents in ensuring their children are prepared in terms of the embodied capitol (knowledge, values and skills) required for success in today's competitive labour markets. In this vein, a trend for academically advantaged parents to try to influence public school systems on behalf of their own children has been noted. For aboriginal parents the situation is complex and impacted by both the historical context as well as evolving cultural expectations. Parents wrestle with the appropriate role of traditional aboriginal knowledge and cultural identity in public education as well as issues related to continuing assimilationist impacts of the school experience.

This presentation will focus on this issue as experienced in a small Northwest Territories community made up of aboriginal and non-aboriginal residents. Cross cultural differences between parent's priorities for their children's education and the impact of these differing agendas appear at times to be experienced as obstacles to cooperative efforts despite common concern for their children's success. The proposed course of research to be carried out by the presenter to investigate this experience further will be outlined.

DISCIPLINE: Education / Social Work.

FIELDWORK LOCATION: Fort Smith, Northwest Territories.

UNIVERSITY OF BRITISH COLUMBIA

01-014 **BEAN, D. and HENRY, G.H.R. (2001).** The Spatial Pattern of Vegetation in a High Arctic Oasis. Presentation, The 16th Annual Symposium of the U.S. Chapter of International Association of Landscape Ecology (US-IALE) Memorial Union, Arizona State University, Tempe, Arizona, April 25-29, 2001.

ABSTRACT/DESCRIPTION:
Environmental changes resulting from global warming are predicted to be most intense at high latitudes and this has considerable implications for the distribution of vegetation in the High Arctic. The relationships among plant community structure, diversity, phenology, and abiotic factors including snowmelt pattern, temperature, soil moisture and soil nutrients were studied at the Alexandra Fiord lowland (78° 53' N, 75° 55' W), a high arctic oasis on the east coast of Ellesmere Island. Digital aerial photographs were used to map the vegetation and the pattern of snowmelt. At each of 28 sampling points, vegetation was surveyed, soil was sampled, temperature was recorded by dataloggers and phenological observations were made on four plant species throughout one growing season. A geographic information system is being used to analyze the data from the discrete sampling points and relate it to the observed distribution of plant communities. From these data are anticipated insights on the spatial interrelationships between vegetation and the abiotic environment with a view to improving predictions of vegetation response to climate change in this region.

DISCIPLINE: Ecology.

FIELDWORK LOCATION: Alexandra Fiord, Ellesmere Island, Nunavut.

01-015 **BRADSHAW, G. D. (2001)**. "Geology of the Wolverine Volcanic-hosted massive sulphide deposit". Yukon Exploration and Geology 2001, pp.269-287.

ABSTRACT/DESCRIPTION:
The Wolverine polymetallic volcanic-hosted massive sulphide deposit occurs in a highly deformed but coherent stratigraphic succession of early Mississippian to early Permian metavolcanic and metasedimentary rocks of the Yukon-Tanana Terrane. The deposit is part of the emerging Finlayson Lake volcanic-hosted massive sulphide district and contains a geological resource of 6,237,000 tonnes grading 12.66% zinc, 1.33% copper, 1.55% lead, 370.9 g/t silver and 1.76 g/t gold. Local stratigraphy consists of four major units including (from oldest to youngest): (1) quartz- and feldspar-phyric volcaniclastic, carbonaceous sedimentary and porphyritic intrusive rocks; (2) interbedded argillite, aphyric rhyolite and magnetite-carbonate-pyrite exhalite; (3) fragmental rhyolite; and (4) interbedded carbonaceous argillite, greywacke, basalt and rhyolite. The mineralization consists of pyrite and sphalerite, with lesser pyrrhotite, chalcopyrite, galena, tetrahedrite-tennantite and arsenopyrite. Mineralization occurs as massive stratiform, massive replacement and sulphide stringer veins. Sulphides are typically massive, fine grained, layered and locally brecciated. Styles of hydrothermal alteration identified in the host rocks include proximal silicification and more distal chloritization, sericitization and, in places, carbonatization. Future

research will be focussed on identifying the salient physico-chemical controls on the mineralization process and their implications for volcanic-hosted massive sulphide exploration in the district and elsewhere.

DISCIPLINE: Geology.

FIELDWORK LOCATION: Wolverine Lake, Yukon.

01-016 GILLIS, E.A. and KREBS, C.J. (2001). Survival of juvenile snowshoe hares. Poster Presentation, The Wildlife Society 8th Annual Conference, Reno, Nevada, September 25-29, 2001.

ABSTRACT/DESCRIPTION:

Snowshoe hares (*Lepus americanus*) are multilittered, synchronous breeders that produce up to four distinct litters of young each summer. During a cyclic population increase, we monitored the survival of 84 juvenile hares from control areas and areas in which supplemental food was provided to determine the effects of litter cohort (i.e. month of birth), food availability, and emigration on post-weaning survival. Predation was the primary proximate cause of death for weaned juvenile hares, accounting for 86% (37/43) of deaths during the study. Twenty-eight day survival did not differ between food addition and control areas for any litter cohort. Over the study period, 28-day survival of juveniles (all cohorts combined) did not differ significantly from adults (juveniles: 0.91, adults: 0.93). However, when examined by juvenile cohort, survival of hares born later in the summer (third and fourth litter cohorts) was significantly lower than that of adults and hares born earlier in the summer (first and second litter cohorts). These differences were the result of differential survival among the litter cohorts during September through November. Emigrants (juveniles that dispersed further than two adult home range diameters from their nest site) did not suffer significantly higher mortality rates than those individuals which did not emigrate (28-day survival estimates emigrants: 0.87, philopatric hares: 0.89), nor was a significant relationship found between dispersal distance (distance from natal nest to first breeding location) and fate (survived or died). Thus, it would appear that during the early increase phase of the snowshoe population, the time of year born influences post-weaning hare survival more than food availability or emigration.

DISCIPLINE: Ecology.

FIELDWORK LOCATION: Kluane Lake, Yukon.

UNIVERSITY OF CALGARY

01-017 **MACKENZIE-GRIEVE, J. and POST, J.R. (2001).** Behavioral thermoregulation in Lake Trout (*Salvelinus namaycush*). Poster Presentation, Canadian Conference for Fisheries Research, Toronto, Ontario January 4-6, 2001.

ABSTRACT/DESCRIPTION:
Dezadeash Lake (60°33', 137 °58') is a shallow, reasonably productive lake that warms considerably in summer months. Kathleen Lake (60° 28', 136° 58') is deep, unproductive and cold. There is considerable concern within the community as to the health/status of the lake trout population in Dezadeash Lake. Lake trout appear to rely heavily on coldwater creek inlet areas for survival when the lake warms, and these areas are easily accessible to anglers. The coldwater creeks are the result of both spring melt and snowbed melt. The main objective of this project is to quantify thermal habitat use by lake trout in each system, and then use this information, in combination with existing information, to predict the impact climate change could have on these lake trout populations and on northern lake trout populations in general.

DISCIPLINE: Ecology.

FIELDWORK LOCATION: Dezadeash Lake and Kathleen Lake, Yukon.

01-018 **MUSIANI, M., et al.(2001).** Hunting, migration and sinks/sources among Northern Canadian wolf populations. Canid Biology and Conservation International Conference, Oxford, UK, September 18, 2001.

ABSTRACT/DESCRIPTION:
In Northern Canada, wolf hunting can be substantial. In 1998, 633 wolves were killed at Rennie Lake (RL), an 8,000-km^2 taiga area that could sustain 53 resident wolves, assuming peak densities. In 1993-2000, 270+/-211 (mean+/-SD) wolves were hunted each winter. Some biologists are alarmed about potential overharvesting related to harvest methods, particularly snowmobile hunting. We aimed at determining whether sink-source mechanisms operate among distinguishable wolf populations. Alternatively, if population differences are not found, wolves could be assigned to a continuous population, and local hunting sustainability would be higher. We captured, fitted satellite or VHF collars, and drew blood from 68 tundra wolves. We sampled wolf scats (>30) and hides (>550) throughout Northern Canada and 304 hides from wolves killed at RL by three hunters in November-December 1999. We analysed 12 DNA microsatellites. This study is the first to document long-range migration of wolves. Tundra wolves migrate with caribou between distinct tundra-summering and taiga-wintering areas (defined as 95% kernels). Our data show that in 1998 wolves congregated in RL. We detected allelic differences between RL, forest and tundra wolves. However, genetics and telemetry showed that some individuals appeared in both RL and tundra categories. We conclude that tundra wolves serve as source population for RL.

DISCIPLINE: Wildlife Conservation, Ecology.

FIELDWORK LOCATION: Rennie Lake, Nunavut and Lac de Gras, Northwest Territories.

CARLETON UNIVERSITY

01-019 COTE, M.M. and BURN, C.R. (2001). A GIS-based analysis of the oriented lakes on Eastern Tuktoyaktuk Peninsula, Northwest Territories. Canadian Quaternary Association Meeting 2001, Whitehorse, Yukon, August 20-24, 2001.

ABSTRACT/DESCRIPTION:
The orientation, size and shape of 578 lakes on Tuktoyaktuk Peninsula were obtained from NTS sheets 107C. D and E by ArcView GIS. These lakes are outside the glacial limits in a tundra plain with <15 m relief. The lakes range from 20 to 1900 ha, and have mean orientation N 07°E, with standard error 1.6°. The maps show 145 former lake basins, with lakes inset in 130 of these. The mean orientations of the basins and inset lakes are not statistically different from each other or the general population. Orientation of lakes has been attributed to cross winds establishing currents that preferentially erode the ends of the lakes. Data from Tuktoyaktuk and Nicholson for 1970-95 indicate a consistent wind regime within the region, with prevailing winds from the east and west. Using data from Nicholson, a geometric model generates resultant lake orientations of N if all winds are considered, and N 8°E if winds above 30 km/h are used. The coincidence of the modelled orientation and lake statistics supports the efficacy of wind-induced effects in orienting the lakes. The similar orientation of existing lakes and former basins suggests that these processes have been effective for at least several centuries.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Tuktoyaktuk Penninsula, Northwest Territories.

01-020 JOWETT, D.M.S. and SCHRODER-ADAMS, C.(2001). Stratigraphy and paleoenvironments of lower cretaceous strata in the Liard Basin. 29th Annual Geoscience Forum Abstracts, Yellowknife, Northwest Territories November 21-23, 2001.

ABSTRACT/DESCRIPTION:
Cretaceous strata of the Liard basin consist mainly of the Albian to Cenomanian Fort St. John Group and the Cenomanian Dunvegan Formation. This study, which extends north from Steamboat Mountain in Northeastern British Columbia (94J/12) and covers the 94N, 940, and 95A-C map sheet areas, is being undertaken to produce the stratigraphic architecture and paleoenvironmental history of the Liard basin. The study is based on outcrop and core analysis, foraminiferal biostratigraphy, digital well log correlation and geochemistry (Rock-Eval). This interval, which is represented by the Chinkeh, Garbutt, Scatter, Lepine, Sikanni and Sully formations, records a variable sea-level history during Albian and Cenomanian time. The details of several transgressive-regressive cycles that have yet to be fully documented will be correlated with strata south of Fort Nelson. More than 30 remote outcrop sections, along with core from northeastern B.C. and Northwest Territories, have been sampled for foraminifera and Rock-eval pyrolysis in collaboration with the GSC NATMAP project and the Northwest Territories Minerals, Oil and Gas Division for the Liard basin area. Initial foraminiferal studies indicate abundant assemblages, which will allow future correlation of strata

throughout the basin. Increased foraminiferal numbers mark the distinct flooding surface at the base of the Garbutt shale, whereas the variable facies of the underlying Chinkeh Formation are impoverished in benthic foraminifera. Initial log correlations have shown a number of distinct markers, particularly within the lower Garbutt, the tops of the Scatter and Sikanni formations, and the Fish-Scales Marker Bed (FSMB) in the upper part of the Sully.

DISCIPLINE: Geology.

FIELDWORK LOCATION: Liard Basin, Yukon.

01-021 **KARUNARATNE, K. and BURN, C. (2001).** The temporal variation of N – factors. Canadian Association of Geographers – Ontario Division, Annual Meeting, Carleton University, Ottawa, Ontario, October 27, 2001.

ABSTRACT/DESCRIPTION:
The N-factor, a ratio of ground surface freezing/thawing index to air freezing /thawing index, is used in numerical models to summarize the microclimate and allow ground surface temperatures to be estimated from air temperatures. Examination of microclimate variables that control the N-factors has not been extensive. N-factors were computed from air and near-surface temperatures measured at Forest, Burned and Meadow sites in Takhini Valley, YT. All of the sites have similar soil texture and moisture, which allow the effects of shading, snow cover and permafrost on the N-factor to be examined. In the Forest, where the active layer and snow cover are thinnest and shading is greatest, the near-surface ground temperature is colder than the other sites during both the winter and summer. The Forest site has a large freezing N-factor (0.56) and a low thawing N-factor (0.46). The ground temperature at the Burned site is warmer than in the Forest throughout the year due to a thicker active layer and snow cover and less shading. The N-factors at the Burned site are 0.33 for the freezing season and 0.66 for the thawing season. The freezing N-factor at the Meadow site is 0.54, which is similar to the Forest site due to low soil moisture and a moderate snow depth, but the thawing N-factor at the Meadow site is high (0.85), because of the lack of shade and absence of permafrost.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Takhini Valley, Yukon.

01-022 **KOKEL, J. S.V., SMITH, C.A.S. and BURN, C.R. (2001).** Physical and chemical characteristics of active layer and permafrost sediments. Canadian Quaternary Association, Annual Meeting 2001, Whitehorse, Yukon, August 20 – 24, 2001.

ABSTRACT/DESCRIPTION:
Physical and chemical characteristics of the active layer and near-surface permafrost were investigated at five sites on Herschel Island, Yukon Territory. Soil soluble cations, moisture content

and organic content profiles at undisturbed sites indicated a thaw unconformity between 50 to 80 cm below the base of the present active layer. Palcoactive layer depth, estimated to be between 90 to 100 cm, is less than at comparable sites in the Mackenzie celta area. The difference may be due to the proximity of Herschel Island to the Beaufort Sea coastline during the early Holocene. Soluble cations in permafrost and in the active layer at recently-disturbed sites were two orders of magnitude higher than in the active layer at undisturbed sites. Na+ was the dominant cation in undisturbed permafrost, recently disturbed active layers, and surface runoff derived from disturbed areas. The degradation of permafrost following terrain disturbance can result in surface salinization, a condition detrimental to vegetation growth. However, leaching of soluble salts from disturbed areas appears to proceed over time. These processes yield a range of soil conditions that contribute to the floristic diversity of Herschel Island.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Hershel Island, Yukon.

01-023 **WEST, K.D. and DONALDSON, J.A. (2001).** Eruptive Timing of the White River Ash Deposit (Yukon, Northwest Territories and Alaska). Conference abstract (1:67), Canadian Quaternary Association, Annual Meeting 2001, Whitehorse Yukon Territory,.

ABSTRACT/DESCRIPTION:
Of numerous unconsolidated tephra beds in the Yukon, Northwest Territories and south-central Alaska, the White River Ash is the largest and most distinct. This air-fall deposit of Holocene tephra has an estimated bulk volume of 25-50 km^3 and covers an area of more than 540,000 km^2. The ash is a bilobate product of two distinct eruptive events of Mount Churchill, ca. 1887 years B.P. (northeni-lobe ash) and 1147 years B.P. (eastern-lobe ash). Recent stratigraphic evidence from several distal deposits of the White River Ash has revealed that the eastern-lobe eruption occurred during the late fall or early winter. Laterally continuous layers of frozen air-fall ash preserved between spring deposits of fluvial sand and gravel support this conclusion. Such accurate knowledge of eruption timing is of particular significance when assessing the cultural impact of volcanic activity on the region's Athapaskan peoples. Currently, work is being done to develop a geochemical fingerprint to differentiate between the two lobes of ash. Other ongoing studies have indicated that the repose period between eruptions of Mount Churchill (approximately 740 years) is similar to that of several other pyroclaslic volcanoes that have erupted unexpectedly after long periods of repose. This indicates a potential of further eruptive activity from Mount Churchill.

DISCIPLINE: Earth Sciences.

FIELDWORK LOCATION: Yukon, Northwest Territories and Alaska.

UNIVERSITÉ LAVAL

01-024 **ARSENAULT, D. et LANGLAIS, A. (2001).** Rapport sur les nouvelles decouvertes au site JhEv-1 (carriere aux petroglyphes de Qajartalik), Nunavik. Rapport de recherche, Université Laval, 2001.

RESUME/DESCRIPTION:
Rapport sur les nouvelles découvertes réalisées lors de la fouille du secteur #2 du site JhEv-1 sur l'Ile de Qajartalik (Qikertaaiik), dans la baie Whitley, détroit d'Hudson, au Nunavik. Une quarantaine de zones d'extraction, révélant différentes étapes dans la production des récipients de stéatite, des outils ayant servi A cette production, ainsi que cinq nouvelles gravures (petroglyphes) ont été mis au jour, révélant encore davantage. L'intensité d'exploitation de cette carrière et la dimension spirituelle du site, en particulier à la période dorsétienne.

DISCIPLINE: Archéologie.

LIEU DU TRAVAIL SUR LE TERRAIN: Qikertaaluk, Québec.

01-025 **FORTIER, D. and ALLARD, M. (2001).** Cryostratigraphy and chronology of syngenetic ice-wedge polygons, Bylot Island, Canadian Arctic Archipelago. Proceedings 31st International Arctic Workshop, University of Massachusetts, Amherst, Massachussettes, March 22, 2001.

ABSTRACT/DESCRIPTION:
Tundra polygons originate from the prolonged growth of ice wedges in permafrost. Following thermally induced stress, primary thermal contraction cracks develop, from which secondary and tertiary cracks may develop to eventually form a polygonal network. We studied a syngenetic ice-wedge polygons network located on a Holocene terrace bordering the glacio-fluvial outwash of glacier C-79, on Bylot Island. Along a 45 m long transect crossing two low-center polygons,16 holes were drilled with a portable corer to a maximum depth of 2.5m. A trench was also dug to observe the ice wedges and the related sedimentary stratas. The stratigraphical and sedimentological analysis of the cores reveal continuous but irregular peat and loess accumulation over a glacio-fluvial outwash since 3200 BP. Sedimentary sequences in the center of the polygons are relatively undeformed and the central zone thus allows paleoecological and paleoclimatological reconstitutions based on stratigraphical changes and radiocarbon dating. The variable content of wind-blown sediments in the sequence suggests windier episodes during the late Holocene. These episodes are separated by wetter and less windy periods favourable to the production of peaty organic matter. Pore ice content in the peat-loess accumulation shows that environmental wetness varied as well during the last 3000 years.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Bylot Island, Nunavut.

01-026 REED, E. and GAUTHIER, G. (2001). The costs of raising a family in Greater Snow Geese. Poster Presentation, Tenth North American Arctic Goose Conference and Workshop, Québec, Québec, April 3-7, 2001.

ABSTRACT/DESCRIPTION:
If reproduction is costly, the amount of parental care provided should be a compromise between benefits to the young and costs to the parents. We examined fitness costs associated with long-term parental care in the Greater Snow Goose. We used multistrata mark-resight models to quantify the effects of providing parental care in the fall and spring (3 and 10 months following hatch) on survival and breeding probabilities of neckcollared adult females. Observations were conducted during fall (1993-1999) and spring staging (1994-1999). Sighting and capture of females was carried at the Bylot Island breeding colony (1997-1999). Females accompanied by young in fall did not have decreased survival in the following year when compared to females that were not accompanied by young. Survival probabilities of females still accompanied by young in spring were 17 percent lower than that of females not associated with young. We found little evidence for a fecundity cost as return rates to the breeding colony were not significantly different between females that were accompanied by young in either fall or spring. These results suggest that the maintenance of long-term parental care in Greater Snow Geese may be a trade-off between a survival cost and some other benefits.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Bylot Island, Nunavut.

01-027 ROYER, S. (2001). Le pentecôtisme inuit: de l'activité communautaire a la foi ardente. Midi-conférence du GETIQ, Université Laval, Québec, Québec, 8 février 2001.

ABSTRACT/DESCRIPTION:
Notre communication comprendra deux grandes parties. D'abord, nous présenteront les difficultés - trouver des informations valables, l'aspect très "personnel" de la problématique (la foi, le spirituel) de notre enquête, etc. - que peuvent poser une recherche qui possède une thématique comme la notre. Ensuite, nous exposerons les objectifs et résultats de notre terrain, ainsi que la méthodologie utilisée lors de notre enquête. Nous deutérons par une brève présentation socio-géographique de Kangiqsujuaq et nous poursuivrons en détaillant les grands objectifs théoriques (observation des pratiques culturelles pentecôtistes, etc.) de notre étude. Nous terminerons par la présentation des principales observations (la ségrégation sociale entre pentecôtistes et non pentecôtistes, etc.) qui peuvent titre tirées de ce terrain et des principales hypothèses qui alimenteront notre deuxième voyage d'études. Notre communication sera appuyée par de nombreux extraits sonores que nous avons recueilli lors de notre terrain.

DISCIPLINE: Sociologie.

LIEU DU TRAVAIL SUR LE TERRAIN: Kangiqsujuaq, Québec.

01-028 **SAULNIER-TALBOT, E. et PIENITZ, R. (2001).** Paléoclimat et évolution post-glaciaire du secteur nord-est de la péninsule d'Ungava, basés sur l'analyse des diatomées, de chironomes et d'isotopes stables préservés das les sédiments lacustres. XXIIe Colloque annuel du Centre d'études nordiques, Université Laval, Québec, Québec, 10 décembre, 2001.

RÉSUMÉ/DESCRIPTION:
Depuis 7000 ans, le paysage cotier de la péninsule d'Ungava a subi des transformations majeures du a la déglaciation. Le relavement isostatique des terres fut suivi par la formation de (acs et la recolonisation progressive du territoire par divers organismes vivants. Notre étude tente de découvrir a quelles epoques ces differents évenements se sont deroules, combien de temps its ont dure et de quelle façon les temperatures ont vane Bans le passe, depuis la formation des lacs jusqu'a l'epoque actuelle. Nos resultats nous permettrons de décrire l'evolution du paysage dans cette region et de fournir ainsi un contexte naturel dans lequel les migrations/déplacements des peuples autochtones de cette region se sont effectués depuis leur arrivée.

DISCIPLINE: Géographie physique.

LIEU DE TRAVAIL SUR LE TERRAIN: Nord-est de la péninsule d'Ungava.

01-029 **VAN HOVE, P.; SWADLING, K. M. and GIBSON, J.A.E. (2001).** "Farthest North Lake and Fjord Populations of Calanoid Copepods *Limnocalanus Macrurus* and *Drepanopus Bungei* in the Canadian High Arctic". Polar Biology, 24 (5): 303-307.

ABSTRACT/DESCRIPTION:
The zooplankton assemblages of Lake A and Disrelo Fjord, northern Ellesmere Island (83°N, 75° W), were surveyed in early summer 1999. In permanently ice-covered Lake A, two glacial calanoid copepod species (*Drepanopus bungei* and *Limnocalanus macrurus*) were found in the top 30 m. All developmental stages of the more abundant *D. bungei* were present, whereas only adults of *L. Macrurus* preyed upon the smaller species. A net tow sample of zooplankton from Disraeli Fjord was mainly composed of *D. bungei* and *L. macrurus*, along with two marine cyclopoid copepods (*Oncaea borealis* and *Oithona similis*). These two zooplankton communities occur within unusual environments that are strongly influences by perennial ice and snow. They will be subject to major habitat disruption should the current warming trends continue in the north polar region.

DISCIPLINE: Limnology.

FIELDWORK LOCATION: Ellesmere Island, Nunavut.

01-030 **THEAU, J. et DUGUAY, C.R. (2001).** Mapping the degradation of the George river caribou herd summer habitat with Landsat data. Poster Presentation, 23rd Canadian Symposium on Remote Sensing, Ste-Foy, Québec, August 23, 2001.

ABSTRACT/DESCRIPTION:
The George River caribou herd in northern Québec-Labrador increased from about 5000 in the 50's to about 700 000 animals in the 90's. This important increase of the population caused an over-use of the summer habitat resulting in a strong degradation of the vegetation cover and the exposition of mineral and organic soils. The very low plant growth-potential and the health damages to the caribou observed in the last years leads us to believe in a decrease of the herd. The study area is located in the northeastern Québec-Labrador peninsula (Canada). Maps of the degradation areas and their spatio-temporal variations are being investigated using remotely sensed data. The first step consists of creating a satellite image process for assessing the spatial distribution and extent of these areas. A recent mosaic of 13 Landsat TM images is used. Classification results are being validated against new and previously collected ground truth data. The second step is to apply the method to older images of the same area acquired in the 70's (Landsat MSS) and 80's (Landsat TM). Principal component analysis will then be used to assess spatio-temporal changes of degradation areas. Finally, maps showing areas of change will be produced.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: George River, Québec.

UNIVERSITY OF MANITOBA

01-031 **HOYT, A. J. (2001).** Integrated management for the Husky Lakes area: A preliminary study of human land use and development. Research Report, Department of Management Studies, University of Manitoba, Winnipeg, Manitoba, December 1, 2001.

ABSTRACT/DESCRIPTION:
This study looked at the extent of subsistence and recreational land use in the Husky Lakes area and residents' views of the threats of and opportunities for development in the area. Interviews with Tuktoyaktuk and Inuvik residents were held in the summer and fall of 2000; verification visits were completed in the summer of 2001. Hunting, trapping, berry-picking, fishing, and wood-harvesting areas were mapped; cabin and camping locations were identified. Local land use issues discussed included vandalism, littering, meat wastage, overcrowding of cabins, and commercial activities' interference with subsistence use. Development topics and issues discussed include oil and gas exploration and extraction (geographical and temporal extent, social, economic, and environmental concerns), tourism and reindeer herd (distribution of benefits, regulation and enforcement, and interference with traditional activities), all-weather road between Inuvik and Tuktoyaktuk (routing, costs and benefits). Options for management of the area were also discussed, including distribution of responsibilities, interaction between decision-making and advisory bodies, and representation and accountability. The study offers some recommendations and conclusions.

DISCIPLINE: Interdisciplinary Studies.

FIELDWORK LOCATION: Tuktoyaktuk and Inuvik, Northwest Territories.

01-032 **KENDRICK, A. (2001).** "Caribou Co-Management in Northern Canada: Fostering Multiple Ways of Knowing". Navigating Nature's Dynamics, Cambridge: Cambridge University Press, (10):241.

ABSTRACT/DESCRIPTION:
The links between social and ecological systems are represented by diverse ways of looking at human-environment relations. The continuing exchange between different ways of knowing may be crucial to integrative thought about social-ecological linkages. For many Indigenous societies, the aspiration of social and ecological systems does not make sense. A `human-environment' divide is especially absent from many arctic and subarctic cultures. How does this fundamental Ideological difference play out in resource management systems that incorporate stakeholders both from `the West' (Euro American) and from Indigenous cultures for whom a human environment or social ecological divide is a relatively new and foreign concept? This chapter looks at the differences that exist in the perceptions of Indigenous caribou-using communities, caribou managers and scientists in co-management processes in arctic and sub-arctic North America. It is contended that these differences represent potential to expand how we think about human-*Rangifer* (caribou) systems as much as they do obstacles to caribou research, monitoring and management derision-making. The process of negotiating cross-cultural differences in the co-management of caribou herds indicates the potential for the growth of alternative resource management systems capable of accommodating

varied ways of knowing and learning.

DISCIPLINE: Interdisciplinary - Social Sciences / Natural Sciences.

FIELDWORK LOCATION: Northern Manitoba / Nunavut.

01-033 **PARKS, I., LIN, S., COOKERY, M.T. and DAVIS, D.W. (2001).** Geology and geochronology of the Island Lake greenstone belt, North-Western Superior Province. Report of Activities 2001, Manitoba Industries, Trade and Mines, Manitoba Geological Survey, pp. 115-120.

ABSTRACT/DESCRIPTION:
The Island Lake greenstone belt is composed of volcanic and volcanogenic sedimentary rocks of the Hayes River Group and sedimentary rocks of the Island Lake Group, all of which are intruded by various plutons. Field mapping and geochronological work in 2001 demonstrated that 1) the Hayes River Group in the western portion of the belt can be divided into lithologically and chronologically distinct structural panels that are correlated with those previously defined in the eastern portion of the belt; 2) there exists a distinct ca. 2728 Ma volcanic unit in the belt; and 3) the Island Lake Group is unconformable on the Bella Lake pluton. The mapping also led to a better definition of the location and nature of the Savage Island Shear Zone in the western part of the belt and the kinematics of the Chapin Bay Shear Zone in the area.

DISCIPLINE: Geology.

FIELDWORK LOCATION: Island Lake, Manitoba.

McGILL UNIVERSITY

01-034 **GARNEAU, S. (2001).** Gullies on Mars: Possible evidence for cold dry climates in the past. Canadian Space Exploration Workshop 2001, Canadian Space Agency, Montréal, Québec, May 24-26, 2001.

ABSTRACT/DESCRIPTION:
This paper presents preliminary evidence that shows how the gullies and small valleys that have formed at spring outlets on Axel Heiberg Island may be useful as a terrestrial analogue for springs on Mars. This paper described how the current tools being used to interpret landscapes (eg. MOC) could be used to find sites with similar topographic characteristics s the spring sites on Axel Heiberg Island.

DISCIPLINE: Astrobiology.

FIELDWORK LOCATION: Axel Heiberg Island, Nunavut.

01-035 **SOARE, R., POLLARD, W. and GREEN, D. (2001).** "A deductive model for evaluating the viability of physical and biological terrestrial analogues." EOS, Annals of the American Geophysical Union, 82(43):501.

ABSTRACT/DESCRIPTION:
This article debated the relative value of various landforms as analogues for Martian Landscapes. It proposes an analogue classification based on the quality of source and target subjects.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Arctic Canada.

01-036 **WENZEL, G.W. and WHITE, L.A. (2001).** Chaos and irrationality: Money and Inuit subsistence practice. International Arctic Social Sciences Association IV, Québec, Québec, May 16-20, 2001.

ABSTRACT/DESCRIPTION:
In the obvious absence of familiar institutional arrangements usually associated with the operations of a monetized economy, Inuit economic relations appear to be chaotic, or at least unordered. Further, this perceived disorderliness is exacerbated by the contemporary reality of Inuit subsistence operations - namely that, while money is a critical input, almost none of the activities associated with the Inuit food economy provide a commensurate monetary output. In neo-classical economic terms, therefore, Inuit subsistence practice appears irrational as well. This paper examines the cash and non-monetary economic flows carried out within a single extended family (Ilagiit) in Clyde River, Nunavut, over ten week period in 1999. This work, while providing valuable quantitative data and

insights into particular transactions, provided the opportunity to examine the movement of both types of resources in relation to predictions derived from earlier work (Dermas 1972; Wenzel 1991, 1995) on traditional Eastern Arctic Inuit economic practices. After a brief description of the project design and the quantitative and transactional data produced, the body of this paper will address the handling of money within the institutional framework of the Inuit subsistence system.

DISCIPLINE: Geography.

FIELDWORK LOCATION: Kangiqtugaapik, Nunavut.

McMASTER UNIVERSITY

01-037 WORTH, D. and ROUSE, W.R. (2001). The alteration of PAR in Great Slave Lake. Poster Presentation, CGU-HS Ontario Student Hydrology Conference, Ottawa, Ontario, November 17, 2001.

ABSTACT/DESCRIPTION:
The attenuation of photosynthetically active radiation (PAR, 400-700nm) was measured on three days during the summer of 2001 near the Inner Whaleback Islands (IWI) located within Great Slave Lake (GSL), Northwest Territories (NWT). The attenuation coefficient (k) for GSL at the IWI was found to increase from 0.23m-lon July 3rd, to 1.00m^{-1} on September 21st, meaning that the depth to the 1% light level decreased from 6.9 m to 1.6 m over the same time period. The increase in PAR attenuation appear to be related to sediment discharge from the Slave River, near Fort Resolution, NT. Satellite imagery indicated that a sediment plume originating from the mouth of the Slave River migrated northwards across GSL over the summer period. Before the IWI were surrounded by the plume, k was low, however, as the plume surrounded the islands over the summer, k increased. Decreases in Secchi depths for GSL from 1998 onwards coincide with the movement of the sediment plume in the lake, suggesting that this event is an annual occurrence. The observed increase in k has several implications for the energy balance of GSL, as it has the potential to decrease heat stored in the lake, thereby influencing turbulent fluxes. This research is a contribution from the Mackenzie GEWEX Study (MAGS).

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Yellowknife, Northwest Territories.

01-038 **CARY, C.H. (2001).** Hoffnungsthal uncovered: Findings from the 2001 excavation at the first Moravian Mission to the Labrador Inuit, Nisbet Harbour, Labrador. Poster Presentation, Council for Northeastern Historical Archaeology Annual Meeting, Kingston, Ontario, October 20, 2001.

ABSTRACT/DESCRIPTION:
In September 2000, remains of the 1.752 "Hoffnungsthal" Moravian mission were found in Nisbet Harbour, north-central Labrador. Test pit excavations uncovered numerous artefacts and sections of the mission house foundations. This summer I returned to Nisbet Harbour to fully excavate the site. The focus of the investigation was to learn more about the architecture of the mission house and to get an understanding of what life was like at the mission during its short occupation period. Preliminary interpretations of the mission's architecture, material culture, and relationship with contemporaneous Inuit sites will be discussed.

DISCIPLINE: Archaeology.

FIELDWORK LOCATION: Nisbet Harbour, Labrador.

01-039 **CHAFFEY, H.L., MONTEVECCHI, W.A. and NEIS, B.(2001).** Integrating scientific and local ecological knowledge (LEK) about Common Eiders in Southern Labrador. Poster Presentation, The Waterbird Society 2001 Annual Meeting, Niagara Falls, Ontario, Canada, November 8-9, 2001.

ABSTRACT/DESCRIPTION:
Research on the history and status of Common Eiders in Labrador and Newfoundland is needed. These seaducks are an important part of the subsistence and traditional diet of coastal Labradorians. Two subspecies of Common Eider, a northern one (*Somateria mollissima borealis*) and a southern one (*S. m. dresseri*), occur in southern Labrador. Little is known about the behavioural ecology and abundance of these subspecies during the non-breeding season. By working with hunters (LEK interviews, duck head collections), analyzing existing scientific data and collecting new scientific data, we are assessing the seasonal occurrences and distributions of these subspecies in southern Labrador. LEK data will also be used to reconstruct the history of shifts in and intensity of local hunting and egg-harvesting pressures on the eiders in St. Peter's Bay, Labrador, a formal federal protected area for eiders. The history of local management and interactions between management initiatives, hunting pressures and technological and fisheries changes are explored. We hypothesize that with the decline in the cod and salmon commercial fisheries in St. Peter's Bay and as a result of technological innovation, harvesting pressure has shifted from the nesting population (*dresseri*) to the wintering population (*borealis*) in this area.

DISCIPLINE: Biology.

FIELDWORK LOCATION: South Labrador coast, Newfoundland.

01-040 **HEATH, J. (2001).** Predation risk from nesting raptors influence the metapopulation of breeding Harlequin Ducks in northern Labrador. 20th Annual meeting of the Society of Canadian Ornithologists, University of Washington, Seattle, WA, August 16-18, 2001.

ABSTRACT/DESCRIPTION:
Landscape considerations are essential for understanding the spatial distribution of many species, especially highly mobile ones. The structure and dynamics of populations, measured at small spatial scales, may not reflect the characteristics of the overall population, across a landscape. The application of metapopulation theory to migratory birds has proven informative in this regard. In eastern North America, Harlequin Ducks (*Histrionicus histrionicus L.*) breed on inland rivers that are patchily distributed, with large areas of unsuitable habitat between watersheds. High return rates to both winter and summer sites provide a mechanism for metapopulation structure. We studied populations of breeding Harlequin Ducks on nine river systems in northern Labrador in 1992-1999. Site persistence (consistent reuse of sites among years) increased with the density and stability of local populations, and considering river systems as demographically independent sub-populations strongly implied source-sink metapopulation structure. Within this eco-region, predation risk may be the primary determinant that produces differences in local populations. Density, stability and site persistence all decreased with increasing densities of birds of prey. A comparison between putative source and sink river systems indicated no differences in local habitat features relevant to the ducks, suggesting that avian predators may exclude Harlequin Ducks from potential habitat, in areas where cliff nesting habitat for raptors is available. These findings hold critical implications for the conservation of Harlequin Ducks and illustrate the importance of a landscape approach to research and management of migratory birds.

DISCIPLINE: Ecology.

FIELDWORK LOCATION: Northern Labrador, Newfoundland.

01-041 **VEITCH, B.G., JONES, I.L. and ROBERTSON, G.J. (2001).** Foraging Ecology and offspring growth Rates of Great Black-Backed Gulls at Two Seabird Colonies in the Western North Atlantic. Poster Presentation, Atlantic Cooperative Wildlife Ecology Research Network, Cape Jourimain, NB, November 1-4, 2001.

ABSTRACT/DESCRIPTION:
Great Black-backed Gulls are known to feed on intertidal invertebrates, fish, human refuse, carrion, other seabirds and their eggs. At Gull Island, Witless Bay, NF there are approximately 27 times as many Herring Gulls as Great Black-backed Gulls which feed on the local garbage dumps, intertidal zones, caplin, as well as the local seabird population. At the Gannet Islands, Labrador breeding Herring Gulls, intertidal zones, caplin, and garbage dumps are virtually non-exsistant. The Gulls at the Gannet Islands are therefore forced to rely upon the eggs, chicks, food loads, and sometime the adults of the local auk populations. No difference was observed between the fledging rates, clutch size, or egg sizes, between the two colonies but the gulls at the Gannet islands did grow faster which

was probably due an adaptation to a shorter breeding season.

DISCIPLINE: Ecology.

FIELDWORK LOCATION: Gannet Islands, Labrador.

UNIVERSITY OF NEW BRUNSWICK

01-042 ALLARD, K.A. and GILCHRIST, H.G. (2001). "Kleptoparasitism of Herring Gulls Taking Eider Eggs by Canada Geese". Waterbirds, 25(2): 235–238.

ABSTRACT/DESCRIPTION:
Nesting in association with species that aggressively attack predators may reduce nest predation in some birds. For example, nesting ducks sometimes benefit from aggressive defence by nesting Canada Geese (*Branta canadensis*). Although Common Eiders (*Somateria mollissima*) commonly nest with gulls (*Larus spp.*), the costs and benefits for eiders of this association remain uncertain. Over two years, 32 instances of kleptoparasitism of Herring Gulls (*Larus argentatus*) by Canada Geese were recorded in arctic Canada. The Canada Geese nested amongst Common Eiders and interrupted Herring Gulls while taking eider eggs. The geese displaced Herring Gulls from approximately ten percent of all eider eggs taken from nests, and ate egg contents themselves. Kleptoparasitism may provide Canada Geese with an important exogenous food resource, but the small overall number of eggs stolen from gulls (less than five percent of all eider eggs laid) limits the potential consequences of additive compensatory predation pressure by gulls within the eider colony.

DISCIPLINE: Ecology.

FIELDWORK LOCATION: East Bay, Southampton Island, Nunavut.

01-043 JAMIESON, S.; GILCHRIST, G. and DIAMOND, T. (2001). Variation in body mass of Common Eiders wintering in the eastern Arctic. Annual Waterbirds Conference, Niagara Falls, Ontario, November 7-11, 2001.

ABSTRACT/DESCRIPTION:
We compared body mass of two races of Common Eiders during the non-breeding season. Northern Eiders were collected in Greenland and Cape Dorset, Nunavut and Hudson Bay Eiders were collected in the Belcher Islands, Nunavut. Collections occurred in mid-winter (15 Jan -26 Feb 01) and in spring (03 Apr - 28 May 01). Body mass was compared using a general linear model. There was no significant difference between body mass of Northern Eiders staging in Cape Dorset and pre-migratory con-specifics in Greenland. Indicating that, unlike many other Arctic breeding waterfowl, they re-fuel close to the breeding grounds. Eiders collected at the Belcher Islands in the spring were significantly heavier than those collected there in winter. Hudson Bay Eiders begin to lay mid- to late June, therefore it is possible that eiders collected in spring had begun to store reserves to be used during breeding. In winter there was no significant difference between Northern Eiders wintering in Greenland and Hudson Bay Eiders wintering in the Belcher Islands. However, in spring Hudson Bay Eiders were significantly heavier than Northern Eiders. Hudson Bay Eiders lay larger clutches and eggs than Northern Eiders, therefore they may need extra reserves during

reproduction. This is a preliminary study, later studies will determine exactly how lipid and protein levels change throughout the non-breeding season.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Cape Dorset, Nunavut.

01-044 OOTES, L., LENTZ, D.R., and CREASER, R. (2001). Timing constraints and Paragenesis of mineralizing events at the Crestaurum gold deposit. Geological Society of America Meeting, John B. Hynes Veterans Memorial Convention Center, Boston, Massachusetts, November 1–10, 2001.

ABSTRACT/DESCRIPTION:
The Crestaurum shear-zone hosted gold deposit is located 14 kilometers north of Yellowknife, NWT, Canada, in the late Archean Yellowknife Greenstone Belt of the southwestern Slave Structural Province. The northeast trending shear zone transects basalts, mixed volcaniclastics, and gabbro and quartz-feldspar prophyry dikes. Multiple layered quartz veins and multiple generations of mineralization are evidence for a composite history. Sulfide mineralization in the gold-bearing veins include pyrite + stibnite + arsenopyrite + sulfosalts + sphalerite + chalcopyrite. Host rock alteration includes chlorite + sericite + biotite + tourmaline + pyrite + arsenopyrite. Other gold bearing veins in the area are west-trending and are base-metal rich. They contain sphalerite + galena + pyrrhotite + pyrite + arsenopyrite + chalcopyrite and reflect a separate mineralizing event from the Crestaurum Shear Zone. Early mineralizing events in the area include syn-volcanic pyrite + pyrrhotite stockworks, magnetic-bearing banded iron formation, and post-volcanic quartz vein-hosted molybdenite within the quartz diorite west of the Crestaurum Shear Zone. This molybdenite mineralizatio has been dated by Re-Os at 2680 Ma and is significantly older than the syn-D2 Crestaurum mineralization.

DISCIPLINE: Geology.

FIELDWORK LOCATION: Ryan Lake, Northwest Territories.

UNIVERSITY OF OTTAWA

01-045 AYOTTE, N. and GAJEWSKI, K.(2001). Treeline dynamics in the Southwest Yukon Territory. Poster Presentation, Canadian Association of Geographers - Ontario Division, Ottawa, Ontario, October 26-27, 2001.

ABSTRACT/DESCRIPTION:
Trees at alpine treeline grow at the limits of their ecological tolerance, thus making treeline sensitive to climatic change. Previous studies have suggested that the warming trend over the past 150 years has resulted in northern treeline expansion. The purpose of this study is to assess the present state of the altitudinal treeline in the Southwest Yukon Territory. Research was conducted in the forest-tundra ecotone on an east-facing slope of the Kluane Range, Southwest Yukon Territory. Standard dendroecological methods were used to examine the state of the altitudinal treeline in the study region. Each krummholz individual (shrubby spruce) in a 20x10m plot was sampled. An age-structure analysis of the krummholz populations in the forest-tundra ecotone was performed to assess tree growth and to determine if the krummholz tree populations are expanding or contracting. Seedlings along four transects from the tundra to the forest were also noted in order to study establishment in relation to elevation. Preliminary results from the age structures indicate that krummholz and seedling growth is being affected by the warming trend during recent centuries. Krummholz individuals appear to be reproducing vegetatively. Seedling establishment is occurring throughout the forest-tundra ecotone and appears to coincide with elevation.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Southwest Yukon Territory.

01-046 BJORNSON, J., LACELLE, D., LAURIOL, B., and CLARK, I.D. (2001). Retrogressive thaw slumps: An open window into the Quaternary of the Richardson Mountains, NWT, Canada. Presentation, Canadian Quaternary Association Meeting, Whitehorse, Yukon, August 20-24, 2001.

ABSTRACT/DESCRIPTION:
In the Northern Yukon and in the Richardson Mountains, N.W.T., distinct periods of geomorphological response to climate change during the Holocene can be distinguished. Photointerpretation, field observations and 14C dating enable the identification of three periods and suggest the beginning of a fourth. The first period, from 11 to 8ka BP, is characterized by a very hot and dry climate conducive to Aeolian deposition observed in the Northern Yukon, and to retrogressive thaw slump activity, observed in the Richardson Mountains. During the second period, 8 to 5ka BP, the climate was warm and humid. During this period the Holocene terraces of the Porcupine and the Old Crow Rivers were established. Finally, form 5ka BP up to recent time, the cool and dry climate has favoured a reactivity of valley erosion, Aeolian deposition, and an increase in solifluction activity and cave icing. Recent geomorphological activity suggests a transition to a fourth period. The warming of the climate, which has been occurring for the last 20 years, leads to the exposure and melting of massive ice bodies as observed in the Richardson Mountains and

probably to the melting of cave ice in the Northern Yukon. The hot paleoclimate at 11 to 8ka BP is perhaps the most relevant analogue of climate warming observed today in the northwest Arctic.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Richardson Mountains, Northwest Territories.

01-047 BUNBURY, J. and GAJEWSKI, K.(2001). Physical limnology of Kluane Lakes. Canadian Association of Geographers - Ontario Division, Ottawa, Ontario, October 26-27.

ABSTRACT/DESCRIPTION:
This study investigates the seasonal cycle of the physical parameters of five lakes in the Kluane Lake Region of the southwestern Yukon. The motivation for this study is paleolimnological studies being conducted in the Yukon and elsewhere. Over the past five years, point samples of physical parameters have been taken once over the course of a season. These point samples are statistically related to plankton assemblages to derive transfer functions describing the relation between these organisms and the physical environment. It needed to be seen if these point samples were representative of the entire summer. The spatial and temporal variability of temperature, dissolved oxygen, specific conductance, pH, total phosphorus, total nitrogen, chlorophyll a, and water clarity were measured at twelve intervals from May to August, 2001. The lakes selected represent a range of lake depth and size. Lakes greater than 7 metres exhibited thermal stratification, while those less than 7 metres were isothermal. As the season progressed, warmer temperatures penetrated further down the water column in two of the stratified lakes. The third stratified lake did not exhibit this same trend due to its large size and greater mixing ability.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Kluane Region, Yukon.

01-048 COULTISH, T.L. and LEWKOWICZ, A.G. (2001). An Investigation of Palsas and Frost Mounds in Wolf Creek, YT. Poster Presentation, Canadian Association of Geographers - Ontario Division, Ottawa, Ontario, October 26-27, 2001.

ABSTRACT/DESCRIPTION:
A total of 26 palsas were studied during the summer of 2001 in Wolf Creek Basin, Yukon Territory, at an elevation of 1260 m.a.s.l. The palsas ranged in size from 1 m to 4 m in height, and typically 5 - 30 m in length. Their stratigraphy typically consisted of a peat layer of 10 cm to 20 cm, underlain by sandy silt. As was expected, the cryostratigraphy of the cores taken from the palsas showed - that segregation processes were responsible for the upheaving of the forms. It appears unlikely that it will be possible to link palsa dynamics to climate variability as a series of beaver dams of different ages traverse the valley bottom. These influence water levels, which in turn may affect rates of thermal erosion of palsa sides. Consequently, local non-climatic factors appear likely to dominate palsa

dynamics at the site. Several other frost mounds were investigated in the area. These features were generally smaller than the pal-2s, and most were found on slopes with their locations apparently related to spring flow. Excavation showed that some of these mounds possessed injection ice. A preliminary hypothesis is that they developed as seasonal frost mounds but have been preserved as perennial forms. This perennial nature is suggested by the concentration of shrubs, including dwarf birch and dwarf willow, on the mounds as compared to the surrounding slope.

DISCIPLINE: Geology.

FIELDWORK LOCATION: Wolf Creek, Yukon.

01-049 KINNARD, K. and LEWKOWICZ, A. (2001). Solifluction and climate change. Poster Presentation, Canadian Association of Geographers - Ontario Division 2001, Ottawa, Ontario, October 26-27, 2001.

ABSTRACT/DESCRIPTION:

During the summer 2001, a solifluction slope was investigated on an alpine plateau above Kluane Lake, Yukon Territory. 13 solifluction lobes of various morphologies were chosen across the slope to examine the variability in the long-term rates of advance and understand the mechanism of lobe dynamic. Among the measured morphometric variables, tread length ranged between 2 and 13.5 m, tread width between 3.2 and 13.5 m and riser height between 10 and 70 cm. Lobes typically increased in size downslope, evolving from small sorted steps near the slope crest to extensive complexes with multiple fronts at the foot. Each lobe was excavated and buried humus was sampled for C 14 dating, 1 and 2 m back from the front and at the base of the modern vegetation mat in front of the lobe's riser. Concentration of boulders at the riser and at the surface, a thicker organic mat at the front and the presence of shear planes in many lobes suggests that frontal advance may result from episodic stress relief at the front following the accumulation of material from upslope. As lobes grow bigger downslope, they start flowing along several planes at the front, which makes interpretation of internal stratigraphy difficult and subsequent dating of theses lobes uncertain. While previous work have concentrated on dating a single lobe to interpret changes in regional climate, this study proposes a methodology to establish the existence of such a climatic modulation by looking how different lobes have evolved from a fixed distance behind their present riser position, and by demonstrating if any change in rates are concurrent between the lobes.

DISCIPLINE: Geology.

FIELDWORK LOCATION: Kluane Lake, Yukon.

01-050 LACELLE. D, BJORNSON, J. LAURIOL, B. and CLARK, I.D. (2001). Isotopic Variations in Retrogressive Thaw Slumps, Richardson Mountains, NWT, Canada. Poster presentation, 58th Eastern Snow Conference, Ottawa, Ontario, May 14-17, 2001.

ABSTRACT/DESCRIPTION:
Several authors have suggested a period of warmest climate and greatest thermokarst activity in the Yukon Coastal Plains, and in the Mackenzie Delta during the early Holocene between 10, 000 and 8000 BP. In this paper, we will present isotopic evidence from ice-rich sediment exposed in retrogressive thaw slumps of an early Holocene warm interval in the Richardson Mountains, N.W.T. The study area is located in the western Canadian Arctic, above the Arctic Circle, in the Richardson Mountains. In June 2000, fieldwork was undertaken within Willow River's basin in the Richardson Mountains, to examine exposed tabular ice-rich sediment within active polycycle retrogressive thaw slumps. Ice-rich sediments were collected from the various units at the exposed sections for stable isotope analysis. Two sedimentary units are recognized in the headwall: an ice-rich diamict (unit 1) underlying an ice-poor re-worked diamict (unit 2). Within cryotextural unit 1, suspended fine and coarse sediments are present. At the contact, erosional in nature, an irregular reticulate network of ice and fines is present which grades into a fine lenticular structure. Clumps of sod resulting from past slumping activity are present throughout unit 2. Fifty-one samples were analysed for unit 1 and have a weighted mean value of -28.2 ± 0.9 per mil for 5180 and -227 ± 7 per mil for 6D. For unit 2, 31 samples were analysed and have a weighted mean value of -22.6 ± 1.8 per mil for 6180 and -181 ± 15 per mil for SD. The low 5180 values characterizing unit 1 are similar to the values from massive ice in the Tuktoyaktuk region (-28 to -35 per mil). The isotopic difference between unit 1 and unit 2 is similar to the Pleistocene-Holocene transition that is responsible for a 6180 shift of approximately 7 per mil. The samples of unit 1 show a linear relationship with a slope of S = 7.9 5180 -5.8 with a correlation coefficient of 0.86. This linear relationship is similar to the global meteoric water line defined by Craig suggesting that the ice originated directly from atmospheric precipitation and was subject to minimal modification by refreezing or evaporation.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Richardson Mountains, Yukon.

01-051 LAURIOL, B., et.al.(2001). Geomorphological response to climate change in the Canadian North West during the holocene: Importance of their recognition. Poster presentation, Canadian Quaternary Association Meeting, Whitehorse, Yukon, August *20–24*, 2001.

ABSTRACT/DESCRIPTION:
In the Northern Yukon and in the Richardson Mountains, N.W.T., distinct periods of geomorphological response to climate change during the Holocene can be distinguished. Photo-interpretation, field observations and 14C dating enable the identification of three periods and suggest the beginning of a fourth. The first period, from 11 to 8ka BP, is characterized by a very hot and dry climate conducive to Aeolian deposition observed in the Northern Yukon, and to retrogressive thaw slump activity, observed in the Richardson Mountains. During the second period, 8 to 5ka BP, the climate was warm and humid. During this period the Holocene terraces of the Porcupine and the Old Crow Rivers were established. Finally, form 5ka BP up to recent time, the cool and dry climate has favoured a reactivity of valley erosion, Aeolian deposition, and an increase in solifluction activity and cave icing. Recent geomorphological activity suggests a transition to a

fourth period. The warming of the climate, which has been occurring for the last 20 years, leads to the exposure and melting of massive ice bodies as observed in the Richardson Mountains and probably to the melting of cave ice in the Northern Yukon. The hot paleoclimate at 11 to 8ka BP is perhaps the most relevant analogue of climate warming observed today in the northwest Arctic.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Yukon and Northwest Territories.

01-052 LEBLANC, M., GAJEWSKI, K. and HAMILTON, P. (2001). Postglacial paleolimnology of a lake on Southern Boothia Peninsula, Nunavut, Canada. Poster presentation, 31st Arctic Workshop, Amherst, Massachusetts, March 22-24, 2001.

ABSTRACT/DESCRIPTION:
Retrogressive thaw slumps open a window into the Quaternary of Willow River, NWT. In many places throughout the valley they expose two units, a clayey till (~10m) underlying a diamicton (~5m). These units are the result of Pleistocene glaciation and the events that followed during the Holocene. Located in the Richardson Mountains 30 km west of Aklavik, the valley was partially invaded by a glacial tongue of the Laurentide ice sheet. Progressing against topography, the tongue blocked the drainage and formed a glacial lake. The glaciolacustrine sediments were overridden by progressing ice and reworked into a clayey till rich in organics. Since the retreat, two elements have profoundly modified the landscape: (1) Ongoing incision of Willow River to 300 m during the Holocene; (2) Periods of retrogressive thaw slump activity. Five 14C dates were obtained from the Willow River cut which established a regional chronology. Ten 14C dates were obtained from the slump sites in the overlying diamicton which indicate periods of important thermokarst activity around 9.5 ka BP and a modern reactivation. Units similar to the Willow River units have been observed elsewhere in polycyclic retrogressive thaw slumps which helps us to understand the genesis of the overlying diamicton. It is interpreted as being an infilled fossil thaw slump, which is exposed by an active slump. Judging by the extensive distribution of the two units and by the many slump scars, we can infer that the retrogressive thaw slumps have been, and still are, a dominant geomorphological agent in Willow River landscape.

DISCIPLINE: Paleolimnology.

FIELDWORK LOCATION: Willow River, Northwest Territories.

01-053 ZALATAN, R and GAJEWSKI, K (2001). Postfire succession in the Jenny Lake Region, Southwest Yukon Territory. Poster presentation, Canadian Association of Geographers, Ontario Division, Carleton University, Ottawa, Ontario, October 26, 2001.

ABSTRACT/DESCRIPTION:

This project investigates the stages of vegetative succession following fire in a relatively dry area of the boreal forest. The postfire successional regime is determined by an analysis of age structure and composition of the vegetation. The first step is to use standard dendroecological techniques to determine if one sample plot is representative of the successional stage of a fire. The age structure of *Picea glauca* (white spruce) in three plots from one fire is used to indicate the variability of postfire succession. The dendroecological approach used in this study involves the sampling of three 10 by 20 m plots in an 1844 fire near Jenny Lake, Yukon Territory. A core or cross-section of every individual is taken to determine the age of the tree. The age structure analysis showed that all three plots are representative of the 1844 fire. The graphs depict similar curves for age structure thus providing evidence for the fact that postfire succession can be measured using one representative plot. This is the first study of postfire succession in the Kluane Lake Region of Southwest Yukon Territory. This study will provide new insights into patterns of succession in a dry boreal forest. In addition, it is relevant as a potential demonstration of the pattern of succession that is likely to occur in a future climate-warming scenario.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Kluane Region, Yukon.

QUEEN'S UNIVERSITY

01-054 **BEIERLE, B.D. (2001).** Late quaternary glacial and climatic history of the West-Central Yukon Territory, Canada.. Ph.D. Thesis, Department of Geography, Queen's University.

ABSTRACT/DESCRIPTION:
Investigation of two areas in the west-central Yukon Territory, Canada suggests that previous glacial and paleoclimatic chronologies require reinterpretation. Both lakes were selected because they lie in terrain previously assumed to have remained unglaciated during the last ice age, yet both appear to have anomalously young basal ages. Cores from Chapman Lake, and geomorphic mapping of the Reid age (Illinoian) moraine in which it lies suggest that the age of the moraine is in fact much younger, and that it was likely deposited during the last ice age (McConnell). Radiocarbon dating and correlations between the Chapman and Gravel Lake organic matter records and the GISP2 ice core suggest that climate following the deposition of this moraine was highly variable, with two cold periods during the Late Glacial correlating to the Older and Younger Dryas. Paleoclimatic reconstructions at Chapman Lake suggest, in contrast to previous work, that the Holocene climate of the Yukon was also highly variable, with intervals corresponding to the Neoglacial, Medieval Warm Period and Little Ice Age recorded in organic matter, grain size and macrofossil data. These data provide important new insight into the glacial chronology and post-glacial climate of the Yukon and suggest that hemispheric and global changes in climate documented from locations elsewhere in North America and Europe also affected the Yukon. This suggests that post-glacial climate across the Northern Hemisphere was actually very uniform and that a persistent atmospheric teleconnection between the Atlantic and Pacific regions existed through the Late Glacial and into the Holocene.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Chapman Lake, Yukon.

01-055 **BEIERLE, B.D. (2001).** Think globally, core locally: Arctic teleconnections during the Late Glacial. 31st Annual Arctic Workshop, Amherst, Massachusetts, March 22-24, 2001.

ABSTRACT/DESCRIPTION:
Changes in thermohaline circulation in the North Atlantic are assumed to have been the cause of rapid climatic changes during the Late Glacial, which were then propagated through the northern hemisphere via ocean circulation. However, ocean circulation models can account for only 1/3 of the reconstructed change in North Pacific sea surface temperature during the Younger Dryas, which suggests an atmospheric transmission mechanism must also have existed at that time. Radiocarbon dates and correlation to the Greenland Ice Sheet Project 2 (GISP2) ice core suggest that both cold and warm events during the Late Glacial were recorded by changes in sedimentation at two organic lakes in central Yukon Territory. These events are reflected by changes in sedimentary organic carbon and grain size as well as clastic and organic sediment flux. Cold events such as the Younger and Older Dryas are characterized by lower organic carbon values, as well as finer grain size, increased sorting and increased clastic flux, while warm events including the Allerod-Balling are

associated with increased organic productivity, coarser grain size, and decreased clastic flux. The strong correlation between these records and the GISP2 ice core record provides evidence for a persistent pan-arctic teleconnection during the Late Glacial and suggests that climatic changes following the last deglaciation were rapidly propagated through the arctic via atmospheric circulation.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Central Yukon.

01-056 BEIERLE, B.D. (2001). Holocene climatic changes in the Central Yukon Territory, Canada. CANQUA Biennial Meeting, Whitehorse, Yukon, August, 23, 2001.

ABSTRACT/DESCRIPTION:
Sediment cores from Chapman Lake, Yukon Territory were analysed to reconstruct paleoenvironmental changes over the past 13,000 years. High resolution organic carbon, macrofossil, grain size, and lithostratigraphic analyses provide evidence for climatic variability in central Yukon and suggest that Holocene climatic changes in this region were similar to those in other regions of North America. High organic carbon levels, as well as abundant charophyte oogonia in the macrofossil record characterized an early Holocene warm interval between 10,000 and 7500 BP. Organic carbon levels began to drop at ca. 7500 BP, declining steadily until ca. 4000 BP, when a major decline in organic carbon content occurred. Charophyte oogonia were replaced by bryophytes as the dominant macrofossil immediately prior to the 4000 BP event, with variable but generally lower organic carbon levels suggesting a cooler and more unstable climate than in the early Holocene. Preliminary evidence suggests conditions began to warm around 1550 BP, with increased organic carbon levels and the reappearance of oogonia in the fossil record. This period of increased productivity ended at 550 BP, with a sharp decline in organic carbon and the return of moss as the primary macrofossil constituent.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Chapman Lake, Yukon.

01-057 BEIERLE, B.D. (2001). Holocene grain size changes in organic lakes, Central Yukon Territory, Canada. Northeastern Section Annual Meeting, Geological Society of America, Burlington, Vermont c, March 2001.

ABSTRACT/DESCRIPTION:
Analysis of sediment cores from organic lakes in central Yukon Territory, Canada suggest changes in Holocene sediment delivery mechanisms occurred as mode shifts, rather then gradational changes. There appear to have been two alternating depositional modes during the Holocene, which are mirrored to varying degrees by other proxy data. Grain size, macrofossil, LOI organic carbon and

magnetic susceptibility (MS) analyses demonstrate a warm, stable early Holocene characterized by fine-grained sediments, high LOI, low MS and warm water macrophyte species. Climate began to cool at ca. 7500 BP, followed by a major shift in sedimentary environment at ca. 4000 BP. This change is reflected in grain size, L0I, MS and macrofassil assemblage, suggesting it represents a major change in climate, possibly correlative to the beginning of the neoglacial. Warmer conditions returned between ca. 1500 and 500 BP. with finer grain sizes, increased organic carbon and the reappearance of warm water macrophytes. Climate after 500 BP appears to have cooled, with coarser, more well sorted grain size distributions, lower LOI and higher MS. This study demonstrates the utility of grain size analysis as a paleoenvironmental proxy indicator, and reveals a more dynamic Holocene climate in central Yukon Territory than previously thought.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Chapman Lake, Yukon.

01-058 **BRISKIE, J.V., and MONTGOMERIE, R. (2001).** "Evolutionary loss of the intromittent organ in birds". Journal of Avian Biology, 32:184-187.

ABSTRACT/DESCRIPTION:
The absence of an intromittent organ (IO) in most species (>97%) of birds is an enigma: birds are the only terrestrial vertebrates in which insemination typically occurs without the use of an IO. In an earlier review, we evaluated six hypotheses to explain the loss of IOs among birds. We found some support for the influence of sperm competition and female choice, but other hypotheses (e.g. avoidance of sexually transmitted disease) could not be tested because of a lack of empirical data. Wesolowski (1999) has criticised our female choice and sexually transmitted disease hypotheses as implausible and insufficient to explain the loss of the IO in birds. Instead, he proposes that IOs were lost to minimise the risk of predation (by shortening duration of copulation) and/or to increase the efficiency of sperm transfer. Here we respond to Wesolowski's (1999) criticisms and test his efficient copulation (EC) hypothesis with data on the duration of copulation in 243 species. Contrary to expectations from the EC hypothesis, copulation durations did not differ significantly between species with and without an IO. Thus we can reject the EC hypothesis as an explanation for the loss of IO`s in birds.

DISCIPLINE: Ecology.

FIELDWORK LOCATION: Scarpa Lake, Nunavut and Churchill, Manitoba.

01-059 **COCKBURN, J.M.H. and LAMOUREUX, S.F. (2001).** Determining grain size in laminated lake sediments using image properties. IMAGES Sediment Image Analysis Workshop, University of Massachusetts, Department of Geosciences, Amherst, Massachusetts, November 8-10, 2001.

ABSTRACT/DESCRIPTION:
Quantifying grain size in laminated sediments using image properties of sediment images, rather than sub-sampling and completing particle size analysis has many practical advantages. Grain size measurements obtained from physical subsampling limited by the resolution of the sampling equipment. We have subsampled sediment at half-millimetre intervals, but found that there was a problem in retaining enough sediment (c. 150 mg) for analysis and typically need use one millimetre-thick subsamples. Our goal is to develop a method to use sediment image properties to determine grain size at fine resolution for detailed paleoenvironmental analysis. We believe this method holds promise as a tool for determining grain size in laminated sediments. Our ongoing work will work with thicker SESE from Summit Lake and to deal with issues regarding image properties from different thin sections. Ultimately, a successful method would aid in characterizing sub-annual events in varied sediments as a measure of environmental variability.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Summit Lake, British Columbia.

01-060 **DOUGLAS, M., MICHELUTTI, N. and SMOL, J. (2001).** The Meretta Lake (Nunavut) story: Sewage addition has potential for paleoclimate and archaeoloeical implications. Canadian Quaternary Association meeting, Whitehorse, Yukon, August 21, 2001.

ABSTRACT/DESCRIPTION:
Meretta Lake, Cornwallis Island, Nunavut was one of the High Arctic sites being studied during the IBP. For close to 30 years (beginning in 1949) it received sewage effluent from a nearby transportation base. Meretta Lake was heavily impacted with algal blooms and became highly eutrophied, especially by high latitude standards. We conducted a paleolimnological analysis of the sediments and traced the nutrient impact on the lake using diatoms, a group of siliceous microfossils and 21 OPb dating. The diatoms recorded the initial impact of nutrient additions and our limnological analyses (1992-1999) showed that the amounts of nutrients were steadily declining.

DISCIPLINE: Ecology / Environmental Sciences.

FIELDWORK LOCATION: Resolute Bay, Comwallis Island, Nunavut

01-061 **GOMBAY, N. (2001).** The commercialisation of caribou in Nunavik: A case study of the impacts of legal and indigenous conceptions of subsistence. Fourth International Congress of Arctic Social Sciences, Québec City, Québec, May 16 to 20, 2001.

ABSTRACT/DESCRIPTION:
In the last few years residents of Nunavik have been exploring the feasibility of establishing a

commercial harvest of caribou. These ventures must be implemented within a specific legal framework which is mainly set out in the James Bay and Northern Québec Agreement (JBNQA). The JBNQA determines who can and cannot have access to country foods in the territory governed by the Agreement. In addition, Inuit must cope with international, federal, and provincial laws that restrict the trade of certain animals and regulate food quality. We will show that some of these regulations do not adequately reflect indigenous conceptions of subsistence resource use. While dealing with the specific issue of the commercialization of caribou, the presentation will identify and discuss the legal foundations for subsistence harvesting in Nunavik, focussing on their impact on access to, and use of, resources. The legal regime derived from the JBNQA will be contrasted with a northern-based, indigenous perspective on subsistence.

DISCIPLINE: Human Geography.

FIELDWORK LOCATION: Nunavik, Northern Québec.

01-062 HAY, M.B., MICHELUTTI, N. and SMOL, J. P. (2001). "Ecological patterns of diatom assemblages from Mackenzie Delta lakes, Northwest Territories". Canadian Journal of Botany, 78: 19-33.

ABSTRACT/DESCRIPTION:
Sediment samples were collected from 77 lakes in the Mackenzie Delta representing a gradient of lakes from those having continual connection with the sediment laden Mackenzie River to lakes having connection for only a couple of days every few years. Diatom assemblages in all the lakes were dominated by a diverse benthic microflora, primarily from the genera Navicula and Nitzschia. Maximum relative abundance of the dominant taxon at all sites was less than 30% and most taxa did not dominate in more than one or two lakes. Delta lake assemblages were distinct from diatom assemblages associated with other regional transects of upland tundra and forest lakes. Non motile epiphytic taxa, such as Cocconeis and Gomphonema, were more common in lakes having a lower influence from the Mackenzie River, reflecting the extensive macrophyte growth within these lakes. Species diversity decreased as macrophyte production increased. Taxa responses along this production gradient were modeled using partial least squares regression. Diatoms were sensitive to the degree of river influence, and the related biological and limnological changes, suggesting assemblages can provide an indication of hydrological variability within Mackenzie Delta lakes.

DISCIPLINE: Ecology / Environmental Science.

FIELDWORK LOCATION: Mackenzie Delta, Northwest Territories..

01-063 LAIDLER, G. and TREITZ, P. (2001). Spectral vegetation indices for estimating biomass in an Arctic environment. Canadian Association of Geographers 2001 Annual Conference, McGill University, Montréal, Québec, May 31 - June 3, 2001.

ABSTRACT/DESCRIPTION:
As climate change and trends in global warming become increasingly apparent, methods for estimating the environmental indicators and impacts of such changes will emerge in parallel. It is postulated that temperature rises will be most evident in, and will have the greatest impact on, high latitudes. These changes will likely be marked by a longer growing season and thus increased vegetation primary productivity, and species ranges, of Arctic plants. Based on these hypotheses, satellite remote sensing may play an integral role in monitoring and estimating these biomass increases - adding one further method to the array of climate change analysis tools to hopefully improve the scope, accuracy, and predictability of climate change models. This poster presentation will focus on the application of spectral vegetation indices to estimate biomass in an Arctic environment. A Landsat 5 TM (July, 1998) scene of the study area, Boothia Peninsula, Nunavut, provides the data for this initial exploration. A series of vegetation indices, including the Normalized Difference Vegetation Index (NDVI) and the Soil Adjusted Vegetation Index (SAVI) are examined to determine their utility for estimating biomass in an Arctic environment.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Boothia Peninsula, Nunavut.

01-064 **LAING, T., and SMOL, J.P. (2001)**. "Factors influencing diatom distributions in circumpolar treeline lakes of Northern Russia." Journal of Paleolimnology, 36: 1035-1048.

ABSTRACT/DESCRIPTION:
Diatom assemblages and limnological data were analyzed from 74 lakes spanning arctic treeline in three geographical regions of northern Russia. Diatom assemblages in tundra and forest lakes were significantly different from each other in all regions, with tundra lakes generally associated with higher abundances of small benthic Fragilaria taxa. Variables related to ion concentration, lake depth, silica concentrations, and surface water temperatures were identified as those factors which explain significant amount s of variation in the diatom assemblages. The importance of climate gradients across treeline diatom distributions provides additional evidence that diatoms may be useful as paleoclimatic indicators.

DISCIPLINE: Ecology / Environmental Science.

FIELDWORK LOCATION: Pechora River, Northern Russia.

01-065 **LAMOUREUX, S.F. (2001).** "A varve record of increased 'Little Ice Age' rainfall associate with volcanic activity, Arctic Archipelago, Canada". The Halocene, 11(2): 246-249, 2001.

ABSTRACT/DESCRIPTION:
Varved sediments from Nicolay Lake, Canadian High Arctic, record major summer rainfall events

over the last five centuries. Increased incidences of summer rainfall occurred during the coldest periods of the 'Little Ice Age' and were strongly clustered in the years immediately following major volcanic events. Comparison of the summer rainfall and proxy air temperature records thus provides a fuller understanding of the nature and causes of natural climate variability in the Arctic. Study of the synoptic conditions associated with the two most recent large summer rainfall events suggests that they are associated with the incursion of cold low-pressure systems from the Arctic Ocean Basin. Volcanic activity may produce atmospheric conditions more conducive to the formation of such low-pressure systems, which generate rainfall at low elevations and summer snowfall at higher elevations, thus explaining the correlation between rainfall and summer snow accumulation recorded in ice cores from high-elevation ice caps.

DISCIPLINE: Earth and Atmospheric Sciences.

FIELDWORK LOCATION: Nicolay Bay, Cornwall Island, Nunavut.

01-066 LEFEBVRE, K., MONTGOMERIE, R. and GASTON, A.J. (2001). "Repertoire, structure and individual distinctiveness of thick-billed murre calls". Condor, 103:134-142.

ABSTRACT/DESCRIPTION:
We describe the vocal repertoires of Thick-billed Murre (*Uria lomvia*) adults and chicks during the breeding season. Using recordings from throughout the chick-rearing period, we identified four distinct calls of chicks and six of adults. We present sonograms and quantitative descriptions of each call and summarize the behavioral context in which they were used. Chick calls are mostly flute-like sounds at approximately the same pitch that tend to develop from a simple peep during hatching through a rapid frequency modulated departure call, given shortly before, during, and after they leave the colony at fledging. Departure calls appear to facilitate interactions between the chick and the attending male parent during this risky period for the chick. Adult calls are lower pitched and sound more gruff, with different call types having significantly different pitch, duration, and number of syllables. Among-individual variation in the crow calls of adults accounts for 44% of the measured variation in this call and indicates the potential for individual recognition, such as the recognition of parents' calls by their chicks, which we have previously documented. Temporal features may form the basis of recognition of adult calls in this species, given that they accounted for twice as much variation as frequency features among individual adults.

DISCIPLINE: Ecology.

FIELDWORK LOCATION: Coats Island, Nunavut.

01-067 LEWIS, T. (2001). Regional Significance and Lacustrine Response to a Large Precipitation Event at Bear Lake, Devon Island, Nunavut. Presentation, 31st International Arctic Workshop, University of Massachusetts, Amherst, Massachusetts, March 22-24, 2001.

ABSTRACT/DESCRIPTION:
Mean annual precipitation in the High Arctic is usually extremely low; most precipitation falls during a small number of discrete events during late summer. Large rainfall events tend to be localized, complicating interpretations of regional rainfall patterns. Though spatially limited, these events produce dramatic responses in glaciers, watersheds, and the lacustrine environment. Understanding environmental responses to precipitation is vital in terms of deciphering paleoenvironmental deposits, and predicting future environmental change.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Bear Lake, Devon Island, Nunavut.

01-068 MICHELUTTI, N., HOLTHAM, A., DOUGLAS, M. and SMOL, J. (2001). Periphytic diatom assemblages from arctic lakes and ponds on Victoria Island, Canada. 16th North American Diatom Symposium, Camp du Nord near Ely, Minnesota, September 19-22, 2001.

ABSTRACT/DESCRIPTION:
In this study epilithic, epiphytic, and surface sediment diatom assemblages were identified from 34 lakes and ponds on north central Victoria Island, Canada. Over 200 taxa and 24 genera were identified. The ultra-oligotrophic nature of these lakes and ponds distinguishes them from other arctic datasets phosphorus, and chlorophyll a were among the lowest recorded in arctic regions. There were major differences in diatom assemblages noted among the lakes and ponds, despite minor environmental gradients. Also, several taxa were noted as being specific to only one habitat. The combination of low nutrient and DOC concentrations suggests that taxa within these sites are already extremely stressed, and should be especially responsive to future environmental changes.

DISCIPLINE: Ecology / Environmental Sciences.

FIELDWORK LOCATION: Wynniatt Bay and Victoria Island, Nunavut.

01-069MIICHELUTTI, N., DOUGLAS, M. and SMOL, J. (2001). Using diatoms to track past trophic changes in Meretta Lake, Cornwallis Island, Canada.. 31st Arctic Workshop, Amherst MA, March 22-24, 2001.

ABSTRACT/DESCRIPTION:
Periphytic diatom assemblages have yet to be used as bio-monitors of lake trophic status in the High Arctic. This study examines periphytic (epilithic and epiphytic) diatom assemblages, collected annually from 1992-2000, in Meretta Lake's littoral zone to determine if they have changed in response to the declining nutrient levels. These periphyton collections likely represent the longest, continuous algal bio-monitoring program in the High Arctic. From 1992-1997, the epilithic and epiphytic diatom assemblages were dominated by the Nitzschia complex, after which Fragilaria

species (e.g. *F. pinnata complex, F. construens*) increased in relative abundance. These Fragilaria species characterized Meretta Lake's early-1900s diatom flora, whereas Nitzschia species did not appear in the lake's paleolimnological history until after the construction of the North Base. The reduced relative abundances of the Nitzschia complex, and the concomitant increase in Fragilaria species after 1997, likely reflect the declining nutrient concentrations throughout the 1990's. Our periphyton data show that similar epilithic and epiphytic taxa that occur in eutrophied temperate lakes, such as the Nitzschia complex of species, may also increase in abundance in polluted high arctic lakes.

DISCIPLINE: Ecology / Environmental Sciences.

FIELDWORK LOCATION: Resolute Bay, Cornwallis Island.

01-070 MICHELUTTI, N., DOUGLAS, M. and SMOL, J. (2001). Tracking Eutrophication and Recovery in a High Arctic Lake Using Diatoms. Conference abstract, *Societas Internationalis Limnologiae*, Melbourne, Australia, February 4-10, 2001.

ABSTRACT/DESCRIPTION:
Meretta Lake, a high arctic lake studied during the 1970s IBP, has been receiving raw sewage since 1949. Decreasing sewage inputs have resulted in a marked decline in nutrient concentrations since the 1990's. A paleolimnological study showed a clear diatom response to the sewage inputs. Since 1992, periphytic diatom samples have been collected from Meretta Lake, representing one of the longest annual biomonitoring programs in the high arctic. This present study examines the response of these diatom assemblages to the recorded declines in nutrient concentrations.

DISCIPLINE: Ecology / Environmental Sciences.

FIELDWORK LOCATION: Resolute Bay, Cornwallis Island, Nunavut

01-071 MICHELUTTI, N., LAING, T.E. and SMOL, J. P. (2001). "Diatom assessment of past environmental changes in lakes located near the Noril'sk (Siberia) smelters". Water, Air, and Soil Pollution, 125: 231-241.

ABSTRACT/DESCRIPTION:
Noril'sk, a major center for mining and smelting of high-sulphur nickel-copper ores, is considered one of the most polluted regions on this planet. Yet, long-term data on limnological changes in nearby lakes are lacking. Paleolimnological approaches were used to compare pre-industrial diatom assemblages with recent assemblages in 17 Noril'sk-area lakes in order to assess the effects of the metallurgical operations. Relative to other regions of intense mining and smelting activities, the Noril'sk diatom assemblages have experienced relatively little change since pre-industrial times. The lakes are well protected against the effects of acidification due to their strong buffering capacities

as a result of the surrounding bedrock and overlying glacial deposits. The alkaline nature of the lakes appears to have suppressed the environmental availability of metals, as most likely formed insoluble metallic complexes and became incorporated into the lake sediments. Changes between recent and pre-industrial diatom assemblages were recorded for some lakes; however, the taxa contributing to the greatest amount of this change were small, benthic Fragilaria species, and not acid and metal-tolerant taxa, as observed in similarly impacted regions. Emissions from mining activities resulting in watershed disturbances, such as increased erosion, likely accounted for shifts in these species over time.

DISCIPLINE: Ecology / Environmental Science

FIELDWORK LOCATION: Noril'sk, Siberia.

01-072 MICHELUTTI, N., et al. (2001). "Diatom changes in lake sediments from the Mackenzie Delta, N.W.T., Canada: Paleohydrological applications". Arctic, Antarctic, and Alpine Research, 33: 1-12 .

ABSTRACT/DESCRIPTION:
Information on hydrological fluctuations and lake dynamics in the Mackenzie Delta was provided in a paleolimnological study of eight delta lakes. Because macrophyte production within Mackenzie Delta lakes is largely governed by the degree of river influence, estimates of past production within a lake may be used to infer past Mackenzie River influence. A diatom-based predictive model using sub-ice winter methane concentrations as an indirect estimate of macrophyte production, was applied to fossil diatom assemblages identified in Mackenzie Delta lake sediment cores. Temporal shifts in the relative abundance of fossil diatom assemblages were recorded at all sites. Benthic and epiphytic fossil diatom taxa were common in lakes with minor river influence, whereas planktonic species dominated lakes with appreciable river connection. The fossil diatom record showed that taxa are responding to changes in the degree of river influence and lake genesis. Lakes having the least amount of river connection supported the most favorable environment for macrophyte production, resulting in the highest sediment organic matter content, and consequently, the highest estimates of methane concentrations. In general, the diatom-inferred winter methane concentrations appeared to be reliable, and indirectly track the main direction of variation in the fossil diatom assemblages. 6The results of this study indicate that diatom taxa in delta lakes are sensitive to hydrological fluctuations in the Mackenzie River, and our present approach would be ideally suited for detecting longer-term (e.g. decadal) hydrological variations.

DISCIPLINE: Ecology / Environmental Sciences.

FIELDWORK LOCATION: Mackenzie Delta, Northwest Territories.

01-073 MONTGOMERIE, R., LYON, B.E. and HOLDER, K. (2001). "Dirty ptarmigan: behavioral modification of sexually selected trait." Behavioral Ecology, 12:429-438.

ABSTRACT/DESCRIPTION:
Males of many bird species acquire a conspicuous breeding plumage through molt. Male rock ptarmigan (*Lagopus mutus*), however, become conspicuous in a unique way-as snow melts away from the tundra, their cryptic white winter plumage suddenly becomes exceptionally conspicuous, and remains so for at least 3 weeks. While males remain white, females molt into one of the most cryptic plumages known in birds. From our 17-year field study in arctic North America, we show that, unlike other birds, male rock ptarmigan eventually change from conspicuous to cryptic by soiling their plumage, thereby reducing their conspicuousness six fold before they molt to their cryptic summer plumage. Individual males began to soil their plumage as soon as their mates began egg-laying, and were maximally dirty and relatively cryptic by the time incubation began and their mates no longer fertilizable. Thus male plumage conspicuousness appears to serve a reproductive function. Moreover, both polygynous and bachelor males delayed soiling for a few days after monogamous males, as expected because of the prolonged mating opportunities available to them. We use these data to address a variety of hypotheses to explain both the conspicuousness of breeding males and their subsequent plumage soiling. Given the high predation rate recorded for male ptarmigan during the breeding season, we argue that male conspicuousness is best explained by sexual selection and that plumage soiling is an adaptation that reduces predation risk by increasing camouflage.

DISCIPLINE: Ecology.

FIELDWORK LOCATION: Melville Peninsula, Nunavut.

01-074 SHERIFF, C., TREITZ, P. and LAMOUREUX, S.F. (2001). Soil Moisture Modelling of Arctic Tundra Soils using SAR. Canadian Association of Geographers Annual Conference, McGill University, Montréal, Québec, May 31 - June 3, 2001.

ABSTRACT/DESCRIPTION:
Soil moisture is an environmental descriptor that integrates much of the land surface hydrology and is the interface between the solid earth surface and the atmosphere. Soil moisture is by nature variable over space and time, making it difficult to measure and use in hydrological and ecosystem applications. Remote sensing, specifically C-Band synthetic aperture radar (SAR) data, offers potential to make frequent and spatially comprehensive estimates of near surface soil moisture. The goal was to model the relationship between SAR backscatter and geophysical parameters (e.g., soil moisture) measured in the field. The study area is located within the Lord Lindsay River watershed (1900 km2) on central Boothia Peninsula, Nunavut. RADARSAT SAR data, with an incident angle of 16°, were collected on August 8, 2000. Concurrent with image acquisition, bulk soil samples were collected at 40 sites throughout the study area. Sample sites were selected as locally homogeneous areas composed of different combinations of vegetation and surficial material that were typical of the watershed. Soil samples were analysed for soil moisture, texture and organic content. Radiometric calibration of the RADARSAT data involved derivation of radar brightness (b°) and radar backscatter (s°) as both amplitude and power values. After georeferencing, radar brightness and backscatter values for the sample sites were compared to soil moisture measures using statistical

techniques to model the relationship between radar response and soil moisture.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Boothia Peninsula, Nunavut.

UNIVERSITY OF SASKATCHEWAN

01-075 DE ROSEMOND, S.C., LIBER, K., WAITE, D. and HARBICHT, S. (2001). The Use of TIEs to Characterize Toxic Components of a Diamond Mine Effluent. Poster presentation, 28th Annual Aquatic Toxicology Workshop, Winnipeg, Manitoba, September 30 - October 3, 2001.

ABSTRACT/DESCRIPTION:

Diamonds are found in kimberlite deposits and extracted mechanically using chemical-free processes that reduce the ore to fine particles (s0.5 mm). The processed effluent consists of approximately 40% kimberlite fines and 60% water that has been used during the extraction. Coagulating and flocculating polymers are added to the effluent to facilitate settling of the fines in the containment facility, Long Lake. Baseline toxicity tests using Ceriodaphnia dubia indicated that the effluent is chronically toxic. A series of Phase I Toxicity Identification Evaluations (TIEs) have been performed in an attempt to classify toxic components of this effluent. Chronic serial dilution toxicity tests indicated that filtered effluent significantly affected survival at concentrations of approximately 50%, and reproduction at concentrations as low as 12.5%. Toxicity of the effluent to C. dubia was not significantly reduced through aeration, solid phase extraction using a C-18 column, nor through the additions of either sodium thiosulfate or EDTA. Graduated pH adjustments of the effluent to pH 6.5 significantly reduced toxicity but did not eliminate toxicity. Further pH manipulations of unfiltered effluent to pH 3.0 completely eliminated toxicity. Toxicity testing of the polymers determined that the coagulating polymer is acutely toxic to C. dubia at low concentrations; the 48-h LC50 was 0.32 mg/L, while the flocculating polymer was relatively nontoxic. The loss of effluent toxicity at low pH may be due to the stabilization of the coagulating polymer in conjunction with hydrolysis of kimberlite minerals.

DISCIPLINE: Toxicology.

FIELDWORK LOCATION: Ekati Diamond Mine, Northwest Territories.

UNIVERSITY OF TORONTO

01-076 **ANTONIADES, D., DOUGLAS, M.S.V., and SMOL, J. P. (2001).** Recent environmental change inferred from diatom records at Isachsen, Ellef Ringnes Island, Candian High Arctic. Poster presentation, Canadian Quaternary Association Conference, Whitehorse, Yukon, August 24, 2001.

ABSTRACT/DESCRIPTION:
Isachsen (78° 47'N, 10°32'W) is located on the west coast of Ellef Ringnes Island in the Canadian Arctic Archipelago. It is subject to perhaps the most extreme climate in Canada, with annual averages of -19.1°C, and only 102 mm precipitation. Sediment cores were extracted from two shallow sites near Isachsen in July of 1996. Sites I-F and 1-0 (unofficial names) showed large differences in water chemistry (e.g. I-F: pH = 5.9, conductivity = 158S; 1-0: pH = 6.9, cond. = 17S), which resulted largely from differences in local bedrock and topography. The diatom communities reflected these differences, showing little overlap between the two sites. However, recent stratigraphic changes occurred in both records. A stable diatom flora dominated by relatively few species existed throughout the lower portions of each core. Within a few centimeters of the sediment surface, both sites showed trends towards new dominant taxa and greater species diversity. This shift occurred at 2.5 cm depth in core 1-0, and 4 cm in core I-F. A diatom calibration set for the Isachsen region is currently being constructed in an effort to determine and quantify the cause of these changes.

DISCIPLINE: Geology.

FIELDWORK LOCATION: Isachsen, Ellef Ringnes Island, Nunavut.

01-077 **ANTONIADES, D., DOUGLAS, M.S.V., and SMOL, J.P. (2001).** Freshwater diatoms from Mould Bay, Prince Patrick Island, Alert, Ellesmere Island, and Isachsen, Ellef Ringnes Island. Poster presentation, Canadian High Arctic 31st Arctic Workshop, Amherst, Massachusettes, March 23, 2001.

ABSTRACT/DESCRIPTION:
In assessing the significance of modern environmental change in the High Arctic, knowledge of baseline conditions and the natural variability of high arctic ecosystems is necessary in order to understand if current changes fall within normal ranges for these systems. Proxy records constructed using methods such as paleolimnology are invaluable due to their ability to reliably infer past conditions. We are developing paleolimnological models using diatom-based transfer function of each of these three sites in an attempt to provide these missing high arctic data sets. This study forms part of a larger database documenting the temporal and spatial distribution of diatoms across the High Arctic. Our regional diatom calibrations from these three high arctic sites will serve to quantify the autecc of diatoms from extreme environments. Samples have been collected from Alert, northern Ellesmere Island (80°0'N, 60°20'W), Ellef Ringnes Island (78°47'N, 103°32'W) and Mould Bay, Prince Patrick Island (76°14'N, 119°20'W). The three sites have a range of annual daily mean temperatures between -17.7 °C to -19.O°C. Annual precipitation ranges from 109 - 162 mm/ year.

A benthic diatom assemblage comprising over 500 diatom taxa has been identified across all three sites.

DISCIPLINE: Geology.

FIELDWORK LOCATION: Mould Bay, Prince Patrick Island, Alert, and Ellesmere Island.

01-078 CHANG, E.R., JEFFERIES, R.L. and CARLETON, T.J. (2001). "Relationship between vegetation and soil banks in an arctic coastal marsh". Journal of Ecology, 89:367-384.

ABSTRACT/DESCRIPTION:
The effects of habitat degradation on the soil bank at La Pérouse Bay, Manitoba are described. Foraging by lesser snow geese leads to loss of vegetation, coupled with changes in soil abiotic conditions and an increase in salinity. The density of seeds and the relative abundance in the seed bank of species characteristic of undisturbed sites decrease following degradation, while the relative abundance of invasive species increases. Vegetation loss had the greatest impact on seed banks of stress-tolerant species and the least impact on species with many widely dispersed seeds. The above-ground vegetation and below-ground seed bank were less similar in undamaged plots than in disturbed plots. In spite of the low degree of similarity, redundancy analysis of the data indicated that approximately half of the variation in the soil seed bank could be explained by the vegetation data and vice versa. More recently degraded soils had richer soil seed banks than those from older disturbances. Site-specific factors not only influenced the species present but also the time lag between loss of vegetation and loss of the seed bank. Seed banks in these impacted and fragmented sites do not recover quickly.

DISCIPLINE: Ecology.

FIELDWORK LOCATION: La Pérouse Bay, Manitoba.

01-079 LEE, P., et al. (2001). Mars and other planetary analogue studies at the Haughton impact crater site, Devon Island, Nunavut. Poster presentation, Canadian Space Exploration, Canadian Space Agency, Workshop, Montréal, Québec, May 25-26, 2001.

ABSTRACT/DESCRIPTION:
Over the past few years, the Haughton impact crater site on Devon Island, Nunavut, Arctic Canada, has emerged as a site of unique value for Mars and other planetary analogue studies. The site is currently under investigation for this analogue potential by the NASA-SETI Haughton-Mars Project (HMP), an international multidisciplinary field research program with key Canadian participation. The HMP comprises two interrelated programs: Science and Exploration Research. The Science program focuses on three main themes: 1) What can we learn about Mars and other planets by comparison with the Earth? 2) What are the effects of impacts on the Earth? 3) What are the properties and possibilities of life in extreme environments on the Earth and possibly elsewhere? The

Exploration Research program is built around the opportunity presented by the Science program.

DISCIPLINE: Limnology and Paleolimnology.

FIELDWORK LOCATION: Haughton Crater, Devon Island, Nunavut.

01-080 **LIM, D.S.S., DOUGLAS, M.S.V. and SMOL, J.P. (2001).** "Diatoms and Their Relationship to Environmental Variables from Lakes and Ponds on Bathurst Island, Nunavut". Canadian High Arctic, 450:215-230.

ABSTRACT/DESCRIPTION:
Diatom taxa are preserved in the surficial sediment of lakes and ponds on Bathurst Island, Nunavut, Canadian High Arctic, and their relationship to 33 environmental variables were examined using multivariate statistics. Baseline and historical environmental data are sparse in the High Arctic, however diatom assemblages preserved in high arctic lakes and ponds can provide proxy data of past environmental changes. Environmental variables Fe^{3+}, Total Phosphorus (Unfiltered) (TPU), Total Nitrogen (TN), Temperature (TEMP), and pH significantly ($P<-0.05$) accounted for variation in the diatom assemblages. TN was also significantly correlated to other nutrient constituents (e.g. TPF, DOC, POC), and most likely represented the collective effects of these other variables in affecting species distributions. A weighted-averaging (WA) model was developed in order to infer nutrient levels from the relative abundances of the 59 most dominant taxa. This model may be used to quantitatively estimate past TN levels from diatom assemblages preserved in sediment cores from Bathurst Island, and may provide a means to track trophic change as a result of climate change in the High Arctic.

DISCIPLINE: Archaeology.

FIELDWORK LOCATION: Bathurst Island, Nunavut.

01-081 **LIM, D. S. S., KWAN, C. and DOUGLAS, M. S. V. (2001).** "Periphytic diatom assemblages from Bathurst Island, Nunavut, Canadian High Arctic - An examination of community relationships and habitat preferences". Journal of Phycology, 37:379-392.

ABSTRACT/DESCRIPTION:
In order to refine our understanding of diatom habitat preference, the dominant diatom taxa found on submerged moss (bryophyte), sediment, and rock substrates from lakes and ponds on Bathurst Island, Nunavut, Canadian High Arctic are examined using multivariate statistical methods. Furthermore, the relationship between key limnological variables and the dominant taxa from each habitat is discussed. The following limnological variables significantly (P 0.05) explain the species variance for each of the three substrates: Na^+ and Total Nitrogen (TN) for moss; Total Phosphorus (Filtered) (TPF) and pH for rock; and Fe^{3+}, Total Phosphorus (Unfiltered) (TPU), TN, Temperature (TEMP) and pH for sediment. This paper extends the current ecological database for high arctic

diatoms, and will play a key role in both understanding biodiversity levels in the High Arctic as well as provide baseline data for future paleoreconstructions of aquatic habitat structure.

DISCIPLINE: Paleolimnology.

FIELDWORK LOCATION: Barthurst Island, Nunavut.

01-082 LAYTON-MATTHEWS, D. (2001). Distribution of Se and other trace element in name of presentation: Massive sulphides of the Wolverine Zn-pb-cu-ag-au volcanic-hosted massive sulphide deposit, Finlayson Lake District, Yukon, Canada. Poster presentation, Geological Association of Canada - Mineralogical Association of Canada Annual Meeting, Memorial University, St. John's, Newfoundland, May 27-10, 2001.

ABSTRACT/DESCRIPTION:
The Wolverine polymetallic deposit is in the Finlayson Lake volcanic-hosted massive sulphide (VHMS) district and contains a resource of 6,237,000 tonnes grading 12.66% zinc, 1.33% copper, 1.55% lead, 370.9 g/t silver and 1.76 g/t gold. In addition to high precious metal concentrations, Wolverine is one of a few VHMS deposits worldwide with high Se-contents (>3000 ppm) within the massive sulphides. Initial mineralogical investigations at Wolverine (Jambor 1996) identified the lead-copper-antimony sulphide meneghinite (Pb,,CuSb,S,,) and recognized selenium (Se) substitution for sulphur in the mineral lattice (up to 1.98 wt% Se; mean = 0.84 wt%). Furthermore, investigation of test concentrates found Se to be present in all of the major sulphide minerals: 0.36 wt% Se in chalcopyrite, 0.12 wt% in sphalerite, 0.047 wt% in pyrite and up to 11.2 wt% in galena (Chryssoulis et al., 1997). The distribution of Se in concentrates suggest a correlation of Se with Pb sulphides; however, such a correlation is in marked contrast to all high Se zones of other VHMS deposits (e.g., Bornite zone at Kidd Creek), where Se correlates positively with Cu. Factor analysis of bulk geochemical data for 80 samples of sulphide mineralization (i.e., not concentrate) from the Wolverine deposit has identified two distinct factors that control element distribution. Factor one accounts for 41 % of the element variance and has strong positive loadings (eigenvalues) for Cu and Se, and negative loadings for Zn, Pb, Ag and Au. Factor two accounts for 39% of the element variance and has strong positive loadings for Ag, Pb and Au, and near zero values for Cu, Zn and Se. Contrary to concentrate studies, factor analysis suggests a strong affinity of Cu and Se, which is consistent with the distribution of Se in higher-temperature (275-350°C) sulphide precipitates from some modern seafloor hydrothermal systems (e.g., 13° North, East Pacific Rise) and some ancient deposits (e.g., Kidd Creek, Ontario and Rosebery, Tasmania). Future research will focus on identifying the physical and chemical controls on the distribution of Se in mineralization at Wolverine and the implications for the distribution of Se and other trace elements elsewhere in the Finlayson Lake Area.

DISCIPLINE: Geology.

FIELDWORK LOCATION: Wolverine Lake, Yukon.

01-083 **MILAKOVIC, B.; CARLETON, T.J and JEFFERIES, R.L. (2001).** "Changes in midge (*Diptera Chironomidae*) populations of sub-arctic supratidal vernal ponds in response to goose foraging". EcoScience, 8:58-67

ABSTRACT/DESCRIPTION:
Chironomid populations in ponds have been examined because they are an important food source for ducks and shore birds, and are also widely used as ecological indicators of change. Seventy ponds were sampled during the summers of 1996 and 1997. They were located within a densely vegetated freshwater area, a relatively undamaged salt marsh and a degraded salt marsh where loss of vegetation had occurred as a result of goose foraging. Principal Components Analysis indicated that of 21 environmental descriptors, salinity was the primary gradient distinguishing ponds. Ponds in the degraded marsh that dried out early were the most saline (8 to 30 %) and those in the freshwater area the least saline (< 2%). Densities of chironomids approached 22,000 m-2 with the highest numbers recorded from salt-marsh ponds. Estimated chironomid biomass in all ponds ranged between 0.7 and 9.0 g dry wt m-2 which reflected differences in species composition of ponds. Freshwater ponds contained seven species from six genera of which five did not occur in the other two habitats. Ponds in the undamaged salt marsh contained five species from five genera of which two were restricted to the area, while only the large-bodied Cricotopus (*Isocladius*) sp., most likely omatus, was representative of ponds in the degraded salt marsh.

DISCIPLINE: Ecology.

FIELDWORK LOCATION: La Pérouse Bay, Manitoba.

01-084 **ROSS, J.M. (2001).** Proposed spatial and temporal reconstruction of the environment for the Igaluktuuq Project, Victoria Island, Nunavut, Canada. Poster presentation, Arctic GIS Workshop, Seattle, Washington, January 22-24, 2001.

ABSTRACT/DESCRIPTION:
The Igaluktuuq Project is a joint venture between the Elders of Cambridge Bay, represented by the Kitikmeot Heritage Society, and Dr. M. Friesen of the University of Toronto. This project is an interdisciplinary study of the oral history and archaeology of the Ekalluk River Region, Victoria Island, Nunavut. Based on the archaeological evidence available, it seems that the choice of site location and the season that the Ekalluk River Region was occupied has varied over time. I will be attempting to determine why the region was utilized differently by the four cultural groups who inhabited the area. Climate is often cited as a potential reason for cultural change in archaeology, and this is particularly the case in the Arctic where the environment is considered harsh. However, in the Arctic there have been few studies which have investigated environmental and cultural data from the same location or in conjunction with each other. I am proposing to reconstruct the environment of the Ekalluk River Region using four proxy indicators including sea level, diatom, soil, and pollen analysis. If there is a correlation between environmental change and changes in the cultural use of the landscape, then this correlation can be used to support the long held view that climate is a

determining factor in the Arctic. If, however, no correlation can be developed then the cause for the differences in utilization of the area can be assumed to reflect differences in cultural choice. Once the environmental analysis is complete, this information will be imported into coverages in ARC/INFO 8 along will coverages dealing with the archaeological data including site location, type, and cultural affiliation. Upon completion of the coverages, different digital elevation models will be produced and the various coverages will be overlaid in order to use the output reports for statistical analysis. This will allow the comparison and analysis of changes in landscape development and utilization through time to be completed.

DISCIPLINE: Archaeology.

FIELDWORK LOCATION: Victoria Island, Nunavut.

01-085 SIDDORN, J.P. and CRUDEN, A.R. (2001). Structural analysis as an aid to exploration in and around the Giant and Con gold deposits. Poster presentation, Exploration Science and Technology Initiative, 2001 Geoscience Forum, Yellowknife, Northwest Territories November 22, 2001.

ABSTRACT/DESCRIPTION:
The prediction and understanding of the structural controls on ore zone plunge in both deposits is based on the structural analysis of ore zones, concentrating on the timing of mineralisation with respect to deformation events (pre./syn/post main deformation), the kinematics of deformation, and the structural style of vein formation. In general, ore plunges within the Giant and Con deposits are controlled by the orientation of D2 fold, boudin and mullion axes. Therefore, detailed structural analysis can help to predict the plunge of ore bodies in now areas of the existing deposits. New insights have also been gained into the offset of ore-bearing deformation zones in Giant and Con deposits by Proterozoic faults. At the deposit scale, a new piercing point solution has been devised using the intersection of the footwall of the Campbell zone with the Jackson Lake Fm. unconformity to determine Proterozoic fault offsets on the Yellowrex and Pud faults. At the camp scale, the piercing point solutions of Campbell (1949) and Brown (1955), combined with information on the strike and dip of the Iownsite Formation, have been reevaluated to develop a new 3D interpretation of the relationship between the Giant and Campbell deformation zones. This interpretation predicts that the Giant deformation zones are NOT the upward extension of the Campbell zone, and that the Campbell zone most likely dips below the Giant deposit projecting to surface in the Back Bay-Fault Lake area.

DISCIPLINE: Geology.

FIELDWORK LOCATION: Yellowknife, Northwest Territories.

UNIVERSITÉ DU QUÉBEC À TROIS-RIVIÈRES

01-086 DUCLOS, I., LÉVÈSQUE, E. and ROCHEFORT, L. (2001). Mesic habitats of the Greater Snow Goose on Bylot Island (Nunavut): Characterization and feeding potential. Presentation, Tenth North American Arctic Goose Conference and Workshop, Québec, Québec, April 3-7, 2001.

ABSTRACT/DESCRIPTION:
On Bylot Island, the Greater Snow Goose population is increasing rapidly. Estimates from 1998 indicate that 50% of the wetlands' carrying capacity is used by geese. However, wetlands represent only a small proportion of the south plain whereas mesic and dry habitats (uplands) cover approximately 90% of the landscape. Though less preferred by geese, uplands are used periodically and they can contribute significantly to the overall carrying capacity of Bylot's south plain. My project is to characterise the mesic habitats and to determine their feeding potential for geese. We established random plots in representative sections of each of the major vegetation zones pre-identified using aerial photos. Within these plots, we evaluated plant cover and diversity, grazing, faeces counts, and environmental parameters using random quadrats. A canonical correlation analysis (CCA) was performed to characterize the dominant plant communities and environmental parameters influencing their distribution. The CCA allowed us to recognize four major plant communities: dwarf-shrub heath, salix-graminoids-forbs, salix-legumes and polar semi-desert. Willows were common in all communities. We recorded abundant signs of grazing by. geese anc lemmings. Overall, leaves and inflorescences of graminoids, alpine milk-vetch (*Astragalus alpinus*) and forbs were grazed in summer. Signs of grubbing were visible in either spring or late season in some zones.

DISCIPLINE: Biology / Plant Ecology.

FIELDWORK LOCATION: Bylot Island, Nunavut.

01-087 **JOHNSTONE, S.E., SandEMAN, H.A. and LIN, S. (2001).** Preliminary structural analysis of the Walker Lake Shear Zone, Laughland Lake map area (NTS 56K/9, 56K/10), central Mainland, Nunavut. Poster presentation, Geological Association of Canada - Mineralogical Association of Canada 2001 Joint Annual Meeting, Memorial University, St. John's, Newfoundland, May 27-30, 2001.

ABSTRACT/DESCRIPTION:

The geology of the Prince Albert Group, Laughland Lake map sheet (NTS 56K), Nunavut, is dominated by metasedimentary, plutonic and volcanic rocks. The dominant structural fabric in this area trends northeast and is axial planar to a map-scale set of upright, open to tight folds. Mineral and extension lineations are developed on the main fabric surfaces and are sub-horizontal to moderately plunging (both to the east and west). The main fabric is locally overprinted by a N-S trending spaced cleavage. The deformation history in the study area can be divided into four major events. The D1 event resulted in isoclinal folding, F1, and development of a transposition foliation, S1. D2 involved NW-SE shortening, resulting in map-scale open to tight F2 folds and a contemporaneous S2 foliation. The most widespread D2 structural element is an intense NE-SW moderately to shallowly plunging mineral and extension lineation. D3 deformation is interpreted to be associated with the Walker Lake Shear Zone (WLSZ). Six discrete mylonite zones comprising the WLSZ are identified in the map area. These zones range from chlorite to amphibolite grade and comprise L>S tectonites. They mostly consist of white to grey tonalitic protomylonite to mylonite, though locally ultramylonite occurs. Within the mylonite zones the dominant foliation is at an oblique angle to the main foliation, trending roughly ENE, and dipping steeply to the south. Mineral stretching lineations within the shear zones are strong and sub-horizontal indicating strike-slip movement. Kinematic indicators observed in the mylonitic strands, including foliation fish, rotated and deformed boudins and C-S fabrics, indicate dextral shear sense. Asymmetric intrafolial folds are evident within the high strain zones, and it is apparent that quartz veins at the shear zone margins have been multiply deformed. D2 and D3 likely represent a deformation continuum, where accumulated D2 strain is accommodated along the shear zone. Folding of the mylonitic fabric indicates that post-mylonite deformation, D4, has occurred. D4 is observed as outcrop scale or larger, open warping (F4) of the shear zone fabric. These folds occur on the outcrop scale and are most commonly observed in the highly strained metasedimentary rocks. Axial planes of F4 folds parallel the N-S trending spaced cleavage observed throughout the belt.

DISCIPLINE: Geology.

FIELDWORK LOCATION: Baker Lake, Nunavut.

01-088 **MARTEL, E., LIN, S. and BLEEKER, W. (2001).** Structural geology of the Jackson Lake Formation, NWT. Presentation, Geological Society of Canada-Minerological Society of Canada Joint Annual Meeting, Memorial University, St. John's, Newfoundland, May 27-30, 2001.

ABSTRACT/DESCRIPTION:
Preliminary results of detailed structural mapping indicate that most of the deformation in the Yellowknife greenstone belt is concentrated along the Yellowknife River Fault Zone. This major Archean shear zone marks the contact between Kam Group volcanics and the Timiskaming-like sediments of the Jackson Lake Formation to the south, and between the Kam and Banting Group volcanics to the north. Structural analysis enabled the recognition of four generations of ductile structures (G1 to G4). Kinematics and regional significance G1 are poorly understood. G2 structures include an S2 foliation oriented clockwise to the shear zone boundary, "S"-shaped F2 folds, and a steeply plunging stretching lineation (L2). G2 is best explained by sinistral shear accompanied by east side up dip-slip movement as indicated by shear sense indicators along L2. G3 and G4 structures are spatially associated with the Yellowknife River Fault Zone. S3 is a strongly developed differentiated crenulation cleavage, oriented counterclockwise to S 1 and S2, axial planar to "Z"-shaped F3 folds. These structures indicate dextral shear during G3. G4 is concentrated in the shear zone where C' shear bands are observed, indicating sinistral shear. The youngest formation of the greenstone belt, the Jackson Lake Formation, potentially records three generations (G2, G3 and G4). G1 to G4 can be correlated with the regional deformation (D1 to D3) (e.g. Bleeker and Beaumont-Smith, 1995). Possibly, G2 and G3 structures represent progressive deformation associated with a single episode of deformation (D2). Gold mineralisation in the Yellowknife area occurred pre- and syn-D2, (Siddorn and Cruden, 2000). D2 may be correlative with G2 and G3, suggesting that syn-D2 gold mineralisation and pre-D2 related paleo-placer gold deposits are potentially present in the Jackson Lake Formation.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Yellowknife, Northwest Territories.

01-089 PARMENTER, A.C., LIN, S. and CORKERY, M.T. (2001). Kinematics of shear zones in the Pipestone Lake area, Cross Lake Greenstone Belt, Northwestern Superior Province, Manitoba. Poster presentation, Geological Association of Canada-Mineralogical Association of Canada Joint Annual Meeting, Memorial University, St. John's, Newfoundland, May 27-30, 2001.

ABSTRACT/DESCRIPTION:
The Pipestone Lake area is located in the east-southeast-trending arm of the Cross Lake greenstone belt. Supracrustal rocks in the area include the Pipestone Lake Group of pillowed and massive basalts, the Gunpoint Group of metavolcanics and metasediments (ca. 2730 Ma), and the Cross Lake Group of metasediments (< ca. 2713 - 2695 Ma). The Pipestone Lake Group can be divided into two spatially separated parts, the northern Pipestone Lake group (exposed along the north shore) and the southern Pipestone Lake group (exposed along the south shore), potentially of different ages. Structures in the area are characterized by two shear zones, the North Pipestone Lake Shear Zone (NPLSZ) and the South Pipestone Lake Shear Zone (SPLSZ), located along the north and south shore of Pipestone Lake, respectively. (/→).

DISCIPLINE: Geology.

FIELDWORK LOCATION: Cross Lake, Manitoba.

01-090 **WOLFE, B. et al. (2001).** Determining flood and climate history of the Peace- Athabasca Delta using a multi-disciplinary Paleolimnological Approach. Poster Presentation, University of Waterloo, Waterloo, Ontario, August 20, 2001.

ABSTRACT/DESCRIPTION:
The Peace-Athabasca Delta (PAD) spans 3900 km^2 and is one of the world's largest boreal freshwater deltas. Numerous perched basins and surrounding wetlands provide a rich habitat for wildlife including large muskrat, bison and duck populations. The nutrient and water balances of these basins, and resulting ecological conditions, are highly dependant on periodic flooding which occurs almost exclusively during high backwater events caused by spring ice-jams on the Peace and Athabasca Rivers. In the absence of periodic flooding, water levels decline and isolated basins can dry up completely resulting in loss of marsh environment. Reduced spring flooding due to flow regulation on the Peace River and climate change represent competing hypotheses to explain the dry conditions that have characterized the PAD during much fo the past 30 years. Rigorous scientific assessment of these hypotheses, however, has been hampered by the lack of hydrological and ecological records of the PAD beyond the brief historical period. In order to evaluate the role of climate variability in regulating flood regimes and ecosystem health of the PAD, we are conducting a multidisciplinary study aimed at producing high-resolution paleolimnological records covering the past 1000 years. Results from this project will contribute to more effective management of water and ecological resources in the PAD.

DISCIPLINE: Earth Science.

FIELDWORK LOCATION: Peace-Athabasca Delta, Wood Buffalo National Park, Alberta.

WILFRID LAURIER UNIVERSITY

01-091 GARDNER, J.T. et al. (2001). Impact of seiche events on the hydraulic properties of the Slave River Delta, NWT. Canadian Geophysical Union 27th Annual Meeting, Ottawa, Ontario, May 14 - 17, 2001.

ABSTRACT/DESCRIPTION:
The Slave River Delta, NWT is located on the southern shore of Great Slave Lake and is subject to seiche conditions that affect it's development. The cumulative effects of a significant fetch distance across the lake from north to south and prevailing northerly winds that generate wind waves, may have a substantial impact on the hydrological balance of the distributaries in the Slave River Delta. Water flow in distributaries open to the lake may be impeded or reversed at some levels in the water column, as a result of such wind shear stress on the water surface. Seiche events caused by sustained periods of northerly winds mayimpede the sediment transport capabilities of the distributaries. Wind measurements (speed and direction) were recorded at the outer portion of the delta with an anemometer and pressure transducers monitored water levels during the summer and fall of 2000. Hydraulic measurements in the distributaries throughout the delta were recorded during the summer of 2000. Wind data from Fort Resolution and Hay River are used to identify the periodicity of seiche event trends in the past by relating the data series from those towns to the data recorded on the delta by statistical means. The area within the delta influenced by seiche conditions is a function of various factors including channel morphology, slope and orientation and antecedent meteorological and hydrological conditions. These factors and the impacts of seiche events may have significant implications on the morphological development of the delta. This study describes seiche conditions at the delta and the impactss on the hydraulic conditions of two major distributaries open to this lake effect.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Slave River Delta, Northwest Territories.

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UNIVERSITY OF ALBERTA

02-001 DANBY, R.K. (2002). Hierarchical Framework for the Study of Alpine Treeline. Presentation, Ecological and Earth Sciences in Mountain Areas, Banff, Alberta, September 6-10, 2002.

ABSTRACT/DESCRIPTION:
Temperature is often cited as the primary variable controlling the potential attitudinal limit of tree growth. However, the response of treeline to temperature change is not linear, making predictions of future shifts as a result of climate warming difficult. Moreover, the actual position and structure of the treeline ecotone is the product of a broad range of physical and biological patterns and processes that interact at multiple scales. This poster presents a methodological framework that accounts for such complexity and illustrates its application to the study of treeline in the Kluane Ranges of southwest Yukon. Four investigations have been initiated using (i) experimental warming, (ii) dendrochronology, (iii) repeat photography, and (iv) GIS-based landscape analysis. Hierarchy theory will be used to link the results of the four investigations into a regional heuristic to better understand the relationship between climate change and treeline dynamics.

DISCIPLINE: Environmental Science / Ecology.

FIELDWORK LOCATION: Kluane Region, Yukon.

02-002 DANBY, R.K. and SLOCOMBE, S. (2002). "Protected areas and intergovernmental cooperation in the St. Elias region". Natural Resources Journal, 42(2):Spring 2002.

ABSTRACT/DESCRIPTION:
Ecosystem-based management is now recognized as the central approach in protected area planning and management. However, objective analyses and assessments of the types of interagency partnerships and collaborative relationships necessary for successful implementation of such an approach are limited. This article provides a detailed description and analysis of cooperation occurring between government agencies in the St. Elias region of Alaska, Yukon, and British Columbia. Cooperation in the region is characterized using a relative scale based on formality and complexity. Generally, complex interagency cooperation is accompanied by formal agreements while informal agreements are most often used in situations with few actors or less pressing management issues. Despite having similar management goals and objectives based on preservation, as well as sharing a collective designation as a UNESCO World Heritage Site, cooperation and coordination of activities between the four primary protected areas in the region are largely limited to informal communication - particularly across the international border. Factors that have acted to limit cooperation are examined and potential approaches for removing these barriers and expanding collaborative activities are discussed.

DISCIPLINE: Life Science / Environmental Biology and Ecology.

FIELDWORK LOCATION: St. Elias Region, British-Columbia, Yukon Territory, and Alaska.

02-003 DRAGON, J. (2002). Commercial hunting of Caribou in the Canadian Arctic. Presentation: Ph.D. Graduate Seminar Series, University of Alberta, Edmonton, Alberta, August 19, 2002.

ABSTRACT/DESCRIPTION:
The hunting of caribou has been a long-standing practice for Aboriginal people in the Canadian Arctic. In the mid 1980's, the Government of the Northwest Territories, in collaboration with the private sector, Aboriginal Organisations, and local communities developed commercial hunting of wild, free-ranging caribou. A caribou herd located on Southampton Island (SHI), Nunavut, provides an excellent opportunity to study the effects of large-scale commercial hunting on the caribou herd and the local economy in a relatively controlled environment. In 1968, approximately 48 caribou were captured and transported from nearby Coates Island to SHI. Free of predators, fully protected from hunting, and abundant vegetation has allowed the herd to increase exponentially since the introduction, and is currently estimated to consist of 30-35000 animals. Commercial harvesting on SHI was initiated as a herd management initiatives to control herd growth, but also to generate economic development within the community. The resource dilemma faced by government officials and Aboriginal groups in the Canadian Arctic is that harvesting of any wild species for profit tends to either open up the species to overharvesting or subject the parties carrying out the activities to potential financial uncertainly. This research on commercial harvesting of caribou in the Canadian Arctic provides greater insight into commercial hunting activities in an attempt to ascertain the biological and economic sustainability of commercial harvesting of caribou in the Canadian Arctic. Accordingly, a simulation model was developed using STELLA software to evaluate the economic viability of commercial harvesting. The research examines the effect of Aboriginal subsistence hunting and historical large-scale commercial harvests on herd dynamics. Finally, several harvesting scenarios were developed to evaluate the economic and biological sustainability of large-scale commercial harvesting on the island.

DISCIPLINE: Resource Management.

FIELDWORK LOCATION: Southampton Island, Nunavut.

02-004 DRAGON, J. (2002). "From H\NHL Penguins to NWT Caribou". UA Website Express News, August 21, 2002.

ABSTRACT/DESCRIPTION:
The hunting of caribou has been a long-standing practice for Aboriginal people in the Canadian Arctic. In the mid 1980's, the Government of Northwest Territories, in collaboration with the private sector, Aboriginal organizations, and local communities developed commercial hunting of wild, free-ranging caribou. A caribou herd located on Southampton Island (SHI), Nunavut, provides and excellent opportunity to study the effects of large-scale commercial hunting on the caribou herd and the local economy in a relatively controlled environment. In 1968, approximately 48 caribou were captured and transported from nearby Coasts Island to SHI. Free of predators, fully protected from

hunting, and abundant vegetation has allowed the herd to increase exponentially since introduction, and is currently estimated to consist of 30-35 000 animals. Commercial harvesting on SHI was initiated as a herd management initiative to control herd growth, but also to generate economic development within the community. The resource dilemma faced by government officials and Aboriginal groups in the Canadian Arctic is that harvesting of any wild species for profit tends to either open up the species to over harvesting or subject the parties carrying out the activities to potential financial uncertainty. This research on commercial harvesting of caribou in the Canadian Arctic provides greater insight into commercial hunting activities in an attempt to ascertain the biological and economic sustainability of commercial harvesting of caribou in the Canadian Arctic. Accordingly, a simulation model was developed using STELLA software to evaluate the economic viability of commercial harvesting. The research examines the effect of Aboriginal subsistence hunting and historical large-scale commercial harvests on herd dynamics. Finally, several commercial harvesting scenarios were developed to evaluate the economic and biological sustainability of large-scale commercial harvesting on the island.

DISCIPLINE: Resource Management.

FIELDWORK LOCATION: Southampton Island, Nunavut.

02-004 **GILES, A. (2002).** Who's pulling whose finger: Gender equity in sport in Canada's North. Conference Paper: 2002 North American Society for the Sociology of Sport (USA), Birmingham, Alabama, November 7, 2002.

ABSTRACT/DESCRIPTION:
The presence of the Canadian Charter of Rights and Freedoms, as well as the United Nations Declaration of Universal Human Rights, suggests that there should no longer be a struggle for gender equity. Nevertheless, despite te presence of these policies, as well as gender equity policies at the Territorial Sport Federations in Canada's North, women are unable to compete in the Dene Games components of the Arctic Winter Games. Drawing on ethnographic research conducted in Sambaa K'e, Northwest Territories, this paper will discuss the challenges of applying Eurocanadian notions of gender equity to Dene women and the Arctic Winter Games.

DISCIPLINE: Human Science / Physical Education and Sport Studies.

FIELDWORK LOCATION: Sambaa K'e, Northwest Territories.

02-006 **MCADAM, A.G. (2002).** "Maternal effects and the potential for evolution in a natural population of animals". Evolution International Journal of Evolution, 56(4):846-851, 2002.

ABSTRACT/DESCRIPTION:
Maternal effects are widespread and can have dramatic influences on evolutionary dynamics, but their genetic basis has been measured rarely in natural populations. We used cross-fostering

techniques and a long-term study of a natural population of red squirrels, Tamiasciurus hudsonicus, to estimate both direct (heritability) and indirect (maternal) influences on the potential for evolution. Juvenile growth in both body mass and size had significant amounts of genetic variation (mass h(2) = 0.10; size h(2) = 0.33), but experienced large, heritable maternal effects. Growth in body mass also had a large positive covariance between direct and maternal genetic effects. The consideration of these indirect genetic effects revealed a greater than three-fold increase in the potential for evolution of growth in body mass (h(2)t = 0.36) relative to that predicted by heritability alone. Simple heritabilities, therefore, may severely underestimate or overestimate the potential for evolution in natural populations of animals.

DISCIPLINE: Life Science / Environmental Biology and Ecology.

FIELDWORK LOCATION: Kluane Lake, Yukon Territory.

02-007 MURRAY, G., and BOXALL, P.C., (2002). Developing sustainable non- timber forest products business opportunities: Is there a First Nations advantage? Project Report: Sustainalble Forest Management Network, Department of Rural Economy, University of Alberta , Edmonton, Alberta October, 2002

ABSTRACT/DESCRIPTION:
This project examines the abundance and aboriginal use of botanical non-timber forest products in the Gwich'in Settlement Area in the Northwest Territories. The Gwich'in people mostly collected wild fruits, the most frequent of which were cloudberries, blueberries and cranberries (lingonberries). The amounts of these fruits they collected were estimated to be greater than other published accounts of northern aboriginal peoples in North America. Biological inventories of the amounts and distribution of the wild fruits were also conducted over two years in representative ecosystems in the Gwich'in Settlement Area. The inventory results suggest that considerable amounts of these fruits can be found, although the between year supply may vary considerably. For example, estimates of cloudberries production in one vegetation type varied from 122 g/m^2 in the year 2000 to 0.0 g/m^2 in 2001. Our study suggests that wild fruits are an important component of Gwich'in diets and are an important component of their traditional land use.

DISCIPLINE: Economics.

FIELDWORK LOCATION: Gwich'in Settlement Area, Northwest Territories.

02-008 NELSON, M. (2002). The Little Red River Cree Nation Harvest Survey, 2001. Poster Presentation: 2002 Sustainable Forest Management Network Conference, Edmonton, Alberta, November 13-15, 2002.

ABSTRACT/DESCRIPTION:
This poster presents the results of the harvest survey conducted in the Little Red River Cree Nation (LRRCN) in 2001. The methods used to carry out the survey are described, including the

employment of community based researchers to visit households within the nation. Findings indicate that the majority of household continue to harvest most types of resources, including ungulates, waterfowl, furbearers, fish, timber, and non-timber forest products. However, the majority of respondents also perceive a declining level of access to bush resources. They cited several barriers that may impede harvesting, including lack of time and money. Replacement costs for the total harvest survey are then presented based upon edible weights of harvested species and current grocery prices. Implications of these finding are then discussed, including the need to address social barriers to harvesting, and to define specific protected areas for harvesting activities and habitat preservation.

DISCIPLINE: Anthropology.

FIELDWORK LOCATION: Little Red River Cree Nation, Alberta.

02-009 RUTTAN, L. (2002). Siting the literature, dialogues on the location of "literature". Presentation: Eighth International Qualitative Health Research Conference, Banff, Alberta, April 2002.

ABSTRACT/DESCRIPTION:
In the western academic tradition the literature review is seen as an essential first step on the road to academic acceptance. The literature review is expected to objectively establish the rationale for the research effort and place the research question within the context of previous research as well as its potential contribution to the field. However, the choice of material for inclusion in any academic literature review is essentially a selection process. A selection process guided by and informed by the influences on and experience of the researcher as well as the expectation of the institution. This we mist acknowledge that the concept of literature review itself is based in the assumptions, traditions and processes of western academia and science. Given this context, challenges in completing the literature review have been mounted by indigenous scholars and others working with indigenous knowledge frameworks. This presentation will focus on current challenges to the received vision of "literature" review and will look at efforts to site the literature within non-western knowledge systems.

DISCIPLINE: Sociology.

FIELDWORK LOCATION: Fort Smith, Northwest Territories.

02-010 SMITH, I.R. (2002). "Diatom-based Holocene paleoenvironmental records from continental sites on northeastern Ellesmere Island, High Arctic, Canada." Journal of Paleolimnology, 27: 9-28 (2002).

ABSTRACT/DESCRIPTION:
Diatom-based Holocene paleoenvironmental records from continental sites on northeastern Ellesmere Island, High Arctic, Canada Stratigraphic changes in diatom assemblages from four small lakes on northeastern Ellesmere Island, High Arctic Canada, provide a proxy of lake-ice cover and paleoenvironmental record. Low absolute diatom abundances and a benthic Fragilaria (*sensu lata*)

dominated assemblage during the postglacial to mid-Holocene record the moderating effects of locally retreating glaciers. Around 5.5 ka B.P. diatom concentrations begin to rise, reaching their highest levels between 4.2 and 3 ka B.P., interpreted to be the warmest period in this region. Topoclimatic differences between lakes on Hazen Plateau and those lower in Lake Hazen Basin account for the initial decline in diatom abundances in the upper lakes after 3 ka B.P. This change is thought to reflect a lowering of the regional snowline, accordant with widely recognized Neoglacial advances on Ellesmere Island and Greenland. Lakes in lower Lake Hazen Basin maintained extensive summer ice free conditions until - 1.9 ka B.P. after which diatom abundances declined, suggesting prolonged summer lake-ice cover through the remainder of the recovered Holocene record. Differences between the records presented here and those from coastal areas of the Canadian High Arctic highlight the unique topoclimatic characteristic and continentality of the Lake Hazen region, and possible effects that local marine environments may have had on coastal records. Such differences serve to demonstrate the inherent geographic variability of paleoenvironmental records from the High Arctic.

DISCIPLINE: Earth and Atmospheric Sciences

FIELDWORK LOCATION: Ellesmere Island, Nunavut

02-011 SOTIROPOULOS, M.A. (2002). Analysis of pond webs in the Whooping Crane Nesting Area, Wood Buffalo National Park. M.Sc. Thesis, Department of Biology, University of Alberta.

ABSTRACT/DESCRIPTION:
To determine if the presence of fish influenced the structure of food webs in ponds used as foraging habitats by Whooping Crane, I sampled aquatic biota and measured environmental characteristics in 36 nesting-area ponds in Wood Buffalo National Park. Principal component analysis indicated that invertebrate communities in ponds with fish were relatively discrete, while fishless ponds were separated into two groups, with beetles and odonates, respectively, occurring as top predators. Isolation from colonization sources and pond morphometry influenced which ponds fish could colonize and persist in, respectively, and which were fishless. Interactions between the biotic and abiotic environments thus contributed to the occurrence of the three community types. Stable isotope analysis revealed differences in the sotopic signatures of food webs containing and lacking fish, with the former being more negative in 813C and 815N, potentially the result of altered carbon sources and different predatory regimes, respectively.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Wood Buffalo National Park, Alberta.

02-011 VAN KESSELL, J.C. (2002). Taking care of bison: Community perceptions of the Hook Lake Bison Recovery Project in Fort Resolution, NT, Canada. M.Sc. Faculty of Graduate Studies and Research Thesis, University of Alberta.

ABSTRACT/DESCRIPTION:
This study describes Native community perceptions of the Hook Lake Bison Recovery Project and options for its future management. In 1999, thirty in-depth, semi-structured interviews were conducted with residents of the community of Fort Resolution, Northwest Territories, including participant and non-participant observations. Resident perceptions about the recovery project and priorities for the future care of the bison appeared to be strongly influenced by their knowledge of the project, their views on proper relationships between humans and nature, and beliefs about the aetiology of disease in bison. Dissemination of knowledge from managers to residents is complicated by challenges of communication between project staff and residents as well as community trust and acceptance of the project and managers. Clearly defined roles and responsibilities of co-management partners are needed to establish a sense of shared decision-making processes and of shared ownership of the recovery project by community members.

DISCIPLINE: Resource Management

FIELDWORK LOCATION: Hook Lake near Fort Resolution, Northwest Territories.

02-012 ZASULA, D. (2002). Full-glacial macrofossils, paleoecology, and stratigraphy of the Bluefish Exposure, northern Yukon. M.A. Thesis, Department of Archaeology, University of Alberta.

ABSTRACT/DESCRIPTION:
Macrofossil analysis at the Bluefish Exposure (67°23'N, 140°21.5'W) provides a record of full-glacial steppe, within a mosaic of vegetaion types, including mid-rich fens, mesic graminoid meadows, and discontinuous tundra. Local vegetation was dependant on physical factors including, moisture, slope, drainage, aspect, and elevation. Comparisons with other multi-proxy data support the hypothesized "Mammoth Steppe" in the Bluefish watershed and substantial environmental variability across eastern Beringia. Terrestrial plan macrofossils yielded 8 AMS 14C ages between 18,880 +/-210 yr BP (AA45509) to 16,440 +/- 120 yr (BP (AA45519), uncalibrated 14C ages, dating the assemblage and deposition of the near-shore deltaic sediments with Glacial Lake Old Crow transgression. A synthesis of regional stratigraphic data indicates two phases of Glacial Lake Old Crow; Stage 1, ca. 35-22 ka BP, correlative to the all-time maximum advance of Laurentide ice; and Stage 2, ca. 22-16 ka BP, correlative to the Katherine Creek Phase Laurentide ice margin.

DISCIPLINE: Archaeology.

FIELDWORK LOCATION: Bluefish Exposure, northern Yukon Territory.

UNIVERSITY OF BRITISH COLUMBIA

02-013 **ARII, K. and TURKINGTON, R. (2002).** "Do nutrient availability and competition limit plant growth herbaceous species in the boreal forest understory?" Arctic, Antarctic and Alpine Research, An Interdisciplinary Journal, 34:251-261.

ABSTRACT/DESCRIPTION:
An experiment was conducted to investigate whether nutrient availability and competition limit aboveground growth of five herbaceous species in the boreal forest understory. The experiment involved adding fertilizer and removing neighbours of selected target individuals of five different species. Aboveground biomass and leaf number were measured as the response variables, and treatment effects were tested using ANOVA and ANCOVA. The five species showed variable responses to fertilizer addition with *Achillea millefolium, Festuca altaica*, and *Mertensia paniculata* showing significant increases. *Lupinus arcticus* had no response and there was a strong negative effect on survival of *Anemone parviflora. Achillea* was the only species that showed some growth limitation due to neighbouring individuals for both biomass and leaf number; other species showed no response.

DISCIPLINE: Ecology.

FIELDWORK LOCATION: Kluane Lake, Yukon.

02-014 **GILLIS, E.A., et al. (2002).** A comparison of arctic ground squirrel populations living at high and low elevation. Presentation, Ecological and Earth Sciences in Mountain Areas Symposium, Banff, Alberta, September 6-10, 2002.

ABSTRACT/DESCRIPTION:
While some species are restricted to valley bottoms or mountain tops, other, often closely related, species are able to exploit habitats at a range of elevations. These "elevation generalists" often show extreme plasticity at a relatively small spatial scale as the environmental conditions vary along an elevation gradient. We compared numerical population trends, reproductive output, and survival of one such elevation generalist, the arctic ground squirrel, from two study areas. The high elevation, alpine site was located between 1700 and 2200 m and while the lower elevation, boreal forest site was at 600 - 1100 m. By comparing the demography of populations living in close proximity but at different elevations we hope to gain insights into factors limiting population growth in the two environments.

DISCIPLINE: Ecology.

FIELDWORK LOCATION: Kluane Lake, Yukon.

02-015 ROLPH, S.G. (2002). Effects of ITEX climate manipulations on nitrogen cycling in the Canadian High Arctic. Presentation, 2002 Arctic System Science All-Hands Workshop, Bell Harbor International Conference Center, Seattle, Washington, February 20, 2002.

ABSTRACT/DESCRIPTION:
Climate warming in high latitudes is expected to increase plant productivity and absorption of $C0_2$ from the atmosphere. This negative feedback to $C0_2$-induced climate warming may be constrained by availability of nitrogen in tundra systems. The objective of this research was to examine changes in N availability in high arctic tundra under experimental warming. Open-top chambers established in five tundra communities at Alexandra Fiord, Ellesmere Island in 1992, increased near-surface temperatures by 1-3°C during the growing season. Soil N availability was measured using ion exchange membranes placed 5 cm into the soil. N mineralization, microbial N immobilization and organic nitrogen transformations were examined using standard buried bag methods. Fresh litter carbon and N concentrations were also measured. Preliminary results indicate that warmer temperatures have increased plant growth and nutrient use efficiency, leading to higher C:N ratios. N availability was also slightly increased in the warmed plots. Analyses of soil C:N ratios will be used to determine if the quality of litter has affected plant nutrient availability over the course of the warming experiments.

DISCIPLINE: Ecology.

FIELDWORK LOCATION: Alexandra Fiord, Ellesmere Island, Nunavut.

02-016 TURKINGTON, R., JOHN, E., WATSON, S. and HETT, P. (2002). "The effects of fertilization and herbivory on the herbaceous vegetation of the boreal forest in northwestern Canada: A ten-year study." Journal of Ecology , 90:325-337.

ABSTRACT/DESCRIPTION:
The influence of fertilizer addition and mammalian herbivore exclosures (a 2x2 factorial design, with four replicates at each of two sites) on the cover, species composition and diversity of the understory vegetation of the boreal forest in the south-western Yukon, Canada, were investigated from 1990 to 1999. This was done to test whether vegetation composition was controlled by resource level alone (bottom-up control), herbivory alone (top-down control), or by both (interactive control). The density of the major herbivore, the snowshoe hare, varied 25-fold, declining from 148 km^2 in 1994, and increasing to a second peak of 198 km^2 in 1998. In control plots most species were remarkably constant in percent cover. After 10 years, most of the major species showed significant responses to fertilizer with four species increasing (*Festuca altaica, Mertensia paniculata, Epilobium angustifolium, and Achillea millefolium*) and three declining (*Linnea borealis, Lupinus arcticus, Arctostaphylos uva-ursi*). Some species took up to 5 years before a response was detected. Fertilization caused a decline in the number of species, and species evenness in the community, a reduction in the proportion of woody species, and an increase in herbaceous dicotyledons and

grasses. The exclusion of herbivores had virtually no impact on the abundance of the vegetation or on species diversity, except in 1990-92 during a decline from a peak of 148 hares km^2 to 29 hares km^2. These results suggest that the percentage cover and composition of herbaceous vegetation in the boreal forest are determined almost exclusively by the productivity of the site (bottom-up control) and that the activities of mammalian herbivores may be important only during peaks in hare population densities (interactive control). Results were both species-specific and time-dependent, suggestion that long-term studies are needed to discriminate between long-term responses to treatments and transient phenomena.

DISCIPLINE: Ecology.

FIELDWORK LOCATION: Kluane Lake, Yukon.

UNIVERSITY OF CALGARY

02-017 **LIVINGSTON, J., FROESE, G., PARKSTROM, G., and SMITH, D.G. (2002).** Reconstructing the late Holocene (last 3000 years) ice-jam history, Dawson City, YK to Circle, AK. Poster Presentation, 39th Annual Conference, Department of Geography, University of Calgary, Calgary, Alberta, March 29, 2002.

ABSTRACT/DESCRIPTION:
A major problem facing hydrologists is the inability to extend the flood history of a river beyond the historic record (~100 years). By augmenting the historic hydrometric record with a pre-historic flood record from sedimentary evidence preserved in overbank deposits, it is possible to obtain a more accurate flood frequency curve from which to assess large flood recurrence intervals. (←/→). This study presents a review of historic ice-jam flooding of the Yukon River (Dawson City and Fortymile, Yukon and Slavens Roadhouse, Alaska) and a new methodology to reconstruct the paleoflood record from sedimentary evidence (flood couplets) preserved in channel overbank floodplain deposits. This method is based on the assumption that identifiable sand-silt couplets separated by organic layers represent large magnitude-duration, low frequency ice-jam floods. Sequences of up to 100 flood beds have been recorded in overbank deposits at twenty-nine sections within the study area; three key sites were selected for detailed analysis. Conventional and AMS radiocarbon dating of organic material between flood deposits are used to help determine the length of available record and large ice-jam flood occurrence. In addition, the late Holocene White River Ash forms a prominent stratigraphic marker in seventeen of the sections. At one exceptional site, tree collars of a mature white spruce bracket the eruption within about 30 years from counting tree rings separating the tree growth collars. An AMS age on the upper tree collar is dated to 1700+/-40 B.P., providing a minimum age for the northern tephra lobe. Finally, the possibility exists to examine the influence of known climate changes (e.g. Little Ice Age, Medieval Warm Period) on late Holocene ice-jam flood frequency.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Dawson City, Yukon and Circle, Alaska.

02-018 **MACKENZIE-GRIEVE, J. and POST, J.R. (2002).** Behavioural thermoregulation in lake trout (*Salvelinus namaycush*) with applications to predicted impacts of global warming. Presentation, Canadian Conference for Fisheries Research and annual meeting with Canadian Society of Limnologists, Empire Landmark Hotel, Vancouver, British-Columbia, January 3-5, 2002.

ABSTRACT/DESCRIPTION:
Movements of lake trout in two lakes in the southwest Yukon Territory were studied over the summer and fall of 2001. Twenty lake trout in Dezadeash Lake were fitted with externally attached radio transmitters, and nineteen lake trout in Kathleen Lake were fitted with externally attached sonar tags. In general, lake trout in Dezadeash Lake appeared to move around more than those in Kathleen Lake. Lake trout in Dezadeash Lake, however, appeared to rely heavily on coldwater creek inlet areas for most of the summer. In many cases lake trout moved between inlet areas along one side of

the lake until water temperatures dropped off in the main lake in the fall. Flow and temperature of the coldwater creeks flowing into Dezadeash Lake were measured over the summer. We expected lake trout would aggregate at inlet areas with the greatest flow and the least seasonal variation in flow. The data appear to support this prediction. The streams that appear to provide the most critical cold water habitat for lake trout are the result of runoff from snowbeds in the Front Ranges of Kluane National Park. It appears, therefore, that in the short term summer thermal habitat for lake trout in Dezadeash Lake should increase as these snowbeds melt off. In the long term, however, the increased variability in precipitation, and reduced availability of cold water run-off (other than spring runoff) should decrease the availability of thermal habitat for lake trout in Dezadeash Lake.

DISCIPLINE: Ecology.

FIELDWORK LOCATION: Kathleen Lake, Yukon Territory.

02-019 MACKENZIE-GRIEVE, J. and POST, J.R.(2002). Thermal habitat use by Northern lake trout. Presentation, North American Lake Trout Symposium, Whitehorse, Yukon Territory, August 14-17, 2002.

ABSTRACT/DESCRIPTION:
Behavioural thermoregulation in two northern populations of lake trout has been studied in 2001 and 2002. Lake trout in these two populations behaviourally thermoregulate according to two very different strategies since one population inhabits a shallow, warm lake with glacial inputs and little summer thermal habitat for lake trout, and the second population inhabits a deep, cold lake with abundant habitat for lake trout. Lake trout in the shallow lake congregate at cold-water creek inlet areas along one side of the lake, while lake trout in the large, deep lake are generally not required to move in order to avoid elevated water temperatures.

DISCIPLINE: Ecology.

FIELDWORK LOCATION: Southwestern Yukon Territory.

02-020 MARAJ, R. (2002). Evaluating the ecological consequences of Land-Use Options on Grizzly Bear Habitat in the Southwest Yukon. Report, Greater Kluane Grizzly Bear Cumulative Effects Project, University of Calgary, Calgary, Alberta March 1, 2002.

ABSTRACT/DESCRIPTION:
This study addresses grizzly bear habitat and human land-use conflict in the southwestern Yukon, Canada. The goal of this project is to identify and protect areas integral to the conservation of grizzly bears, while maintaining opportunities for human land use. An important feature of this study is its trans-boundary and interagency approach. The large home ranges of bears and the expansive nature of wildlife travel corridors necessitate this. We will use primary field data to develop a digitized map series and to model grizzly bear population dynamics in relation to habitat

alteration. Data collection techniques used to understand grizzly bear habitat use and population dynamics include VHF telemetry. Information on human use, such as traffic volume, mining claims, and infrastructure development, is available through various federal and territorial management agencies. An adaptive management decision-making framework will be used to identify the uncertainly in parameters, gaps in knowledge, and stochastic elements of the ecosystem modelling process. With this information managers will potentially be able to foresee and prevent loss of prime grizzly bear habitat, and will gain a better understanding of the cumulative effects of human land-use on grizzly bear populations. Resulting benefits to grizzly bear habitat should include identification, preservation, and improved management of prime and susceptible areas within and among management boundaries.

DISCIPLINE: Ecology / Environmental Science.

FIELDWORK LOCATION: Haines Junction, Yukon Territory.

02-021 ROUSE, W.R., et al. (2002). "The annual carbon budget for fen and forest in a wetland at Arctic Treeline". Arctic, 55 (3):229-237.

ABSTRACT/DESCRIPTION:
Three separate research efforts conducted in the same wetland-peatland system in northern Hudson Bay Lowland near the town of Churchill Manitoba, allow a comparison of two carbon budget estimates, one derived from longterm growth rates of organic soil and the other based on shorter term flux measurements. For a tundra fen and an open subarctic forest, calculation of the organic soil accumulation or loss over the last half century indicate that while the fen on average has lost small amounts of carbon from the ecosystem, the adjacent forest has gained larger amounts of atmospheric carbon dioxide. These longer-term data are supported by shorter-term flux measurements and estimates, which also show carbon loss by the fen and carbon uptake by the forest. The shorter- term data sow that the fen's carbon loss is largely attributable to exceptionally dry years especially if they are warm. The forest may gain carbon at an increased rate as it matures and during warm growing seasons. Also, the changes in relief of the dynamic hummock-hollow landscape in the fen may inhibit photosynthesis.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Churchill, Manitoba .

02-022 SCHARIEN, R.K., YACKEL, J.J. and BARBER, D.B. (2002). On the relationship between wind speed, sea ice melt pond evolution SAR scattering. Presentation, 2002 International Geoscience and Remote Sensing Symposium, Toronto, Ontario, June 24-28, 2002.

ABSTRACT/DESCRIPTION:

Melt ponds dominate the surface radiation balance of first-year sea ice (FYI), making it a climatologically significant feature of the ocean-sea-ice atmosphere (OSA) interface. Recent research has utilized remote sensing to determine the variability of melt pond structures and their fractional coverage on sea ice. Specifically, time series RADARSAT-1 synthetic aperture radar (SAR) scattering coefficients have been used to detect the formation of melt ponds and estimate their fractional coverage. However, the contribution of capillary waves to surface scattering received by a SAR sensor is particularly significant for wind-roughened melt ponds. The complexity arises due to the fact that ponds are a sub-resolution of current spaceborne SARs. In this paper we (1) Describe the analytical framework for quantifying the relationship between melt pond capillary waves and surface roughness from synthetic aperture radar (SAR) scattering, and (2) Assess the relationship of melt pond size and depth to surface roughness (RMS slope). We present these preliminary findings using in situ data from the Collaborative Interdisciplinary Cryospheric Experiment (C-ICE) 2001 and 2002 field experiments and SAR backscatter from coincident RADARSAT-1 overpasses.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Truro Island, Nunavut.

02-023 **WALTER, F.S.A., WILLIAMS, J.L.M., SJOGREN, D.B. and MOORMAN, B.J. (2002).** Hypsometric analysis of glacier terminus fluctuations: Preliminary results from Bylot Island, Nunavut. Presentation, 32nd International Arctic Workshop, Institute of Arctic and Alpine Research, University of Colorado, Boulder, Colorado, March 14-16, 2002, pp. 209-210.

ABSTRACT/DESCRIPTION:
While substantial, the impacts of a rapidly changing climate on fragile northern environments are poorly understood. In particular, the linkages between climate, glacier response and geomorphic activity in areas of glaciated / non-glaciated transition are exceptionally complex. It is often assumed that a change in glacier terminus position represents a response to a change in climate. Although certainly the case in the long term, it is unclear how the dynamics of glaciers cause lagged responses which, in turn, influence the pattern of retreat in the short term. This research project focuses on the fluctuation of glacier terminus positions on Bylot Island, Nunavut, Canada. (/→).

DISCIPLINE: Geography.

FIELDWORK LOCATION: Bylot Island, Nunavut.

02-024 **WILLIAMS, J.L.M., WALTER, F.S.A. and MOORMAN, B.J. (2002).** Flow dynamics of a polythermal glacier, Bylot Island, Nunavut, Canada. Presentation, 32nd International Arctic Workshop, Amherst, Massachusettes, March 14-16, 2002.

ABSTRACT/DESCRIPTION:
From July 12 - July 21, 2001, a detailed survey was conducted on a section of the ablation area on

Glacier B28, informally named Stagnation Glacier on Bylot Island, Nunavut, Canada. The objective of the study was to quantify surface movement of an Arctic polythermal glacier. (←/→) While preliminary results fail to reveal vertical uplift of the glacier surface, a surface lowering of ca. 1.70 mm/h, potentially caused by ablation, was observed. Horizontal measurements revealed surface velocities of ca. 4-5 mm/h with peak velocities not corresponding to peaks in discharge. Dye-tracing tests revealed that the drainage system evacuating Stagnation Glacier was dominated by rapid through flow which does not permit water storage to occur. Future research will determine overall flow patterns of the glacier ice on the surface and internally and conclude whether ablation is the principal factor affecting surface lowering.

DISCIPLINE: Geography.

FIELDWORK LOCATION: Bylot Island, Nunavut.

CARLETON UNIVERSITY

02-025 COTE, M.M. (2002). The influence of elevation and aspect on permafrost distribution in Central Yukon Territory. M.A. Thesis, Department of Geography, Carleton University.

ABSTRACT/DESCRIPTION:
Air and ground temperature at eleven sites within various biogeoclimatic zones along a N-S cross-section of Lightning Creek valley, near Keno, demonstrate the significance of atmospheric inversions on mean annual temperature. The mean annual air temperature increases with elevation by 2.2 C over the lower 160 m of Keno Hill, but declines above this level. Permafrost is present on the N-facing slope of Sourdough Hill but is absent on part of the S-facing aspect of Keno Hill, due to winter inversions and high summer solar radiation. The association of biogeoclimatic zones with permafrost was defined with thermal and physical data from the sites. With vegetation interpreted from aerial photographs and topographic information from a digital elevation model these associations were tested in the wider Keno area. Coniferous and alpine tundra are diagnostic of continuous permafrost, while S-facing slopes with aspen trees are permafrost-free. Permafrost is discontinuous beneath other vegetation classes.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Keno, Yukon Territory.

02-026 KOKEL, J.S.V. (2002). Near-surface ground ice in sediments of the Mackenzie Delta Region, Northwest Territories. Ph.D. Thesis, Department of Geography, Carleton University.

ABSTRACT/DESCRIPTION:
Physical and chemical characteristics of near-surface permafrost in the Mackenzie Delta region, N.W.T., were studied in the summers of 1999 to 2001. In sediments of the Mackenzie Delta, ice-poor permafrost was encountered on aggrading point bars colonized by willows. A near-surface ice-rich zone, 1 to 2 m thick, occurred in silt loam soils at spruce forest sites elevated above the level of annual flooding. Lower-lying mesic sites colonized by alder and sedge communities were also underlain by ice-rich permafrost. The factors that influence ground ice accumulation in sediments of Mackenzie Delta are: (1) sediment texture; (2) sedimentation rate; (3) soil moisture; and (4) ground-thermal regime. In hummocky terrain adjacent to the Delta, ice-poor permafrost developed beneath a rapidly aggrading permafrost table (4 cm a-1), but a near-surface ice-rich interval 10 to 20 cm thick developed where the permafrost table remained static for over two decades. The maximum thickness of the ice-rich intervals beneath decadal and millennial thaw unconformities was 30 cm, indicating that near-surface ground ice may accumulate in the absence of an aggrading permafrost table. Under a static permafrost table, initial rates of ice accumulation were on the order of 1 to 10 mm a-1 , but total ice accumulation above a millennial thaw unconformity indicates that in aggregate, these initial rates must decrease with time. Permafrost was nutrient-rich relative to the mineral soils at the base of the active layer throughout the study region. Nutrient enrichment of permafrost with respect to overlying active-layer sediments was greatest at ice-rich sites. Within a

profile, the correspondence between ice-rich intervals and zones of cation enrichment indicates that solutes migrate with water along thermally-induced suction gradients and accumulate in the near-surface ice-rich zone. There is a clear, positive association between the ice content of near-surface permafrost and the extent of tree lean at sites in the Mackenzie Delta, suggesting that aggradation and/or degradation of ice-rich permafrost may cause spruce trees to tilt. The effect of ground-ice development on the tilt of spruce trees was corroborated at a black spruce site in hummocky terrain where reaction-wood rings indicating tree tilting was produced during periods of active-layer thinning and aggradational ice development.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Mackenzie Delta, Northwest Territories.

02-027 **TRINDADE, M.; GREENE,D.; RESCH, C. and GRAVEL, M. (2002).** Long-distance pollen dispersal of Picea mariana near Inuvik, NWT. Sustainable Forest Management Conference, Edmonton, Alberta November 13-15, 2002.

ABSTRACT/DESCRIPTION:

Tree migration rates in response to recent climate change will partially depend on the overall amount of seeds an isolated tree can produce; this seed production in turn depends on pollen receipt. We have tested a micrometeorological model for pollen dispersal using *Picea mariana* pollen collected at a recent fire near Inuvik, NWT. Pollen was passively collected up to 1300 m away from a Picea mariana source. These values were then corrected for local differences in wind speed using roto-rods and anemometers. The pollen deposition averaged 21 grains/cm squared within the source down to 3 grains/cm squared at 1300 m. Inverse modelling indicated a modal pollen deposit density of the point source dispersal curve at essentially X=0 (i.e. at the base of each tree), with a standard deviation of the vertical winds of about 0.1 m/sec during this relatively stable release period. The model achieved an r-squared value of 0.823.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Inuvik, Northwest Territories.

02-028 **OFFMAN, S.T. and SHORTHOUSE, J.D. (2002).** "Complexity of Component Communities associated with the stem gall on wild roses along geographic gradients in Northern Ontario". Newsletter of the Biological Survey of Canada (Terrestrial Arthropods), Volume 22(1):Spring 2002.

ABSTRACT/DESCRIPTION:

Component communities of parasitoids and inquilines associated with multi-chambered stem galls induced by *Diplolepisspinosa* on *Rosa blanda* were different over two geographic gradients in Northern Ontario. Inquilines were more abundant over the western gradient from Rainy River to Red Lake than they were in the eastern gradient from Manitoulin Island to Moosonee. The reasons for differences in community composition will be discussed.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Fort Severn, Ontario.

UNIVERSITÉ LAVAL

02-029 ALBERTON, L. (2002). Tracéologie et outillages paléoesquimaux: la quête des comportements techniques. XXI colloques annuel de l'Association des archéologues du Québec, Musée du Bas-Saint- Laurent, Rivière-du-Loup, Québec, 24 mai 2002.

RESUME/DESCRIPTION:
Cette communication élaborait le projet de développement référentiel adapté au contexte arctique. Nous présentions l'apport de ce projet et de la pratique systématique de la tracéologie pour la recherche archéologique au Nunavik.

DISCIPLINE: Archéologie.

LIEU DU TRAVAIL SUR LE TERRAIN: Quaqtaq, Nord du Québec.

02-030 BELZILE, C., WARWICK, F., VINCENT, J.A.E.G., and VAN, P. (2002). "Bio-optical characteristics of the snow, ice and water column of a perennially ice-covered lake in the High Arctic". Canadian Journal of Fisheries and Aquatic Sciences, 58(1):2406-2418.

ABSTRACT/DESCRIPTION:
Lake A is a meromictic, perennially ice-covered lake located at the northern limit of North America (latitude 83°N, Ellesmere Island, Canada). In early June 1999, only 0.45% of incident photosynthetically available radiation (PAR) was transmitted through its 2-m ice and 0.5-m snow cover. Removal of snow from 12 m^2 increased PAR under the ice by a factor of 13 and biologically effective ultraviolet radiation (UVR) by a factor of 16 (from 0.4% to 6.3% of incident). The diffuse attenuation coefficient (Kd) for UVR was substantially lower in the ice than in the underlying freshwater (e.g., 50% lower at 320 nm), indicating the exclusion of chromophoric dissolved organic matter (CDOM) during freeze-up or the subsequent degradation of CDOM retained in the ice. Peak phytoplankton concentrations occurred immediately under the ice, and a broad maximum of photosynthetic sulfur bacteria and associated sulfur particles was observed over the depth interval 20–45 m at <0.005% of incident PAR. Climate-induced changes in the overlying snow and ice have the potential to cause major habitat disruption (UV exposure, PAR, temperature, mixing regime) for these stratified, extreme-shade communities.

DISCIPLINE: Limnology.

FIELDWORK LOCATION: Ellesmere Island, Nunavut.

02-031 BELZILE, C., GIBSON, J.A.E. and VINCENT, W.F. (2002). "Colored dissolved organic matter and dissolves organic carbon exclusion from lake ice: Implications for irradiance transmission and carbon cycling". Limnology and Oceanography, 47(5): 1283-1293.

ABSTRACT/DESCRIPTION:
Thick ice cover is a feature of cold-temperate, polar, and alpine lakes and rivers throughout much of the year. Our observations from Canadian lakes and rivers across the latitudinal gradient 46-80°N show that their overlying ice contains low concentrations of dissolved organic carbon (DOC) and colored dissolved organic matter (CDOM) relative to the underlying waters. The CDOM exclusion factor (water/ice) ranged from 1.4 to 114 and was typically greater than twice the exclusion factor for inorganic soluted. Application of synchronous fluorescence analysis to lake ice samples and experimentally frozen lakewater indicated that only less complex, lower molecular weight molecules were retained within the ice. Consistent with this analysis, DOC-specific absorption showed that the DOC in the ice was generally less colored than that in the underlying waters. The reduced CDOM absorption showed that the DOC ice allowed relatively high ultraviolet (UV) transmission despite the elevated scattering within the ice and resulted in UV diffuse attenuation coefficients up to eight times lower in the ice than in the underlying waters. This relatively low attenuation by the ice would cause organisms trapped near the surface by inverse stratification to experience high UV exposure prior to ice breakup. The ice exclusion effect gives rise to a concentrated zone of CDOM and DOC that is likely to favor heterotrophic and mixotrophic processes and influence biogeochemical interactions.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Arctic Canada.

02-032 **BÊTY, J., GAUTHIER, G., KORPIMAKI, E. and GIROUX, J.F. (2002).** "Shared predators and indirect trophic interactions: Lemming cycles and arctic-nesting geese". Journal of Animal Ecology, 71: 88-98, 2002.

ABSTRACT/DESCRIPTION:
1. We investigated the hypothesis that cyclic lemming populations indirectly affect arctic-nesting greater now geese (*Anser caerulescens atlanticus L.*) Through the behaviourial and numerical responses of shared predators.
2. The study took place on Bylot Island in the Canadian High Arctic during two lemming cycles. We recorded changes in foraging behavior and activity rate of arctic foxes, parasitic jaegers, glaucous gulls and common ravens in a goose colony during one lemming cycle and we monitored lemming activity of foxes for 7 years. We also evaluated the total response of predators (i.e. number of eggs deprecated).
3. Arctic foxes were more successful in attacking lemmings than goose nests because predators were constrained by goose nest defense. Predators increased their foraging effort on goose eggs following a lemming decline.
4. Activity rated in the goose colony varied 3.5-fold in arctic foxes and 4.8-fold in parasitic jaegers, and were highest 2 and 3 years after the lemming peak, respectively. The breeding output of arctic foxes appeared to be driven primarily by lemming numbers.
5. Predators consumed 19-88% of the annual goose nesting production and egg predation intensity varied 2.7-fold, being lowest during peak lemming years. Arctic foxes and parasitic jaegers were

the key predators generating marked annual variation in egg predation.

6. Our study provides strong support for short-term, positive indirect effects and long-term, negative indirect effects of lemming populations on arctic-nesting geese. The outcome between rodents and many terrestrial arctic-nesting birds.

DISCIPLINE: Animal Ecology.

FIELDWORK LOCATION: Bylot Island, Nunavut.

02-033 FALLU, M-A., ALLAIRE, N., and PIENITZ, R. (2002). "Distribution of freshwater diatoms in 64 Labrador (Canada) lakes: Species–environment relationships along latitudinal gradients and reconstruction models for water colour and alkalinity". NRC Research Press Web Site, http://cjfas.nrc.ca, March 5, 2002.

ABSTRACT/DESCRIPTION:
The distribution of modern diatom assemblages in surficial sediments of 64 Labrador (Canada) lakes across broad vegetational biomes was studied in order to explore species–environment relationships and to develop transfer functions for paleoenvironmental reconstruction. The study sites were situated along a latitudinal gradient (51°27' to 57°37'N) and classified according to six catchment vegetation types: wetland (peatland) forest, spruce/fir forest, lichen woodland, forest–tundra, coastal tundra, and tundra. Canonical correspondence analysis revealed that among 28 environmental variables determined for each site, water colour and alkalinity accounted for most of the variance in the diatom data. Using weighted-averaging partial least squares techniques, we developed transfer functions for inference of water colour (CLR) (r 2 jack = 0.85, root mean square error of prediction (RMSEP) = 0.18log(CLR + 1) or 1.51 Pt units) and alkalinity (ALK) (r 2 jack = 0.63, RMSEP = 0.25log(ALK + 1) or 1.78 eq·L–1) from the percent abundance of the 132 most abundant diatom taxa. By determining diatom distribution in relation to more detailed vegetation types within the boreal forest zone (wetland forest, spruce/fir forest, and lichen woodland), this calibration data set demonstrated the potential of these assemblages for revealing more subtle changes in lake catchment vegetation over time.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Nain, Labrador.

02-034 GIBSON, J.A.E., WARWICK, V.F., and VAN HOVE, P. (2002). "Geochemistry of ice-covered, meromictic Lake A in the Canadian High Arctic". Aquatic Geochemistry, 8:97-119, 2002.

ABSTRACT/DESCRIPTION:
The geochemical processes occurring within meromictic Lake A (max depth 120 m) on northern Ellesmere Island, Canada, were investigated to determine the history of the lake and to provide a baseline for future studies. The lake contained seawater diluted by freshwater input that had been

mixed prior to the lake's isolation from tidal action. Input of freshwater after isolation of the lake created vertical stratification resulting in the creation of distinct oxic, suboxic and anoxic zones. Dissolved oxygen was present to 13 m, and sulphide beneath 32 m. Manganese and iron cycling dominated the redox chemistry between these depths. Total manganese concentrations reached 176 M, higher than in most other natural stratified lake or marine environments.

DISCIPLINE: Biogeochemistry.

FIELDWORK LOCATION: Ellesmere Island, Nunavut.

02-035 GREENE, D.F., MESSIER, C., ASSELIN, H., and FORTIN, M-J. (2002). "The effect of light availability and basal area on cone production in *Abies balsamea* and *Picea glauca*". NRC Research Press, http://canjbot.nrc.ca, April 12, 2002.

ABSTRACT/DESCRIPTION:
Mean annual seed production is assumed to be proportional to basal area for canopy trees, but it is not known if sub-canopy trees produce fewer seeds than expected (given their size) because of low light availability. Ovulate cone production was examined for balsam fir (*Abies balsamea* (L.) Mill.) and white spruce (*Picea glauca* (Moench) Voss) in 1998 and for balsam fir in 2000 in western Québec using subcanopy stems, near or far from forest edges, or (at one site) planted white spruce trees in fully open conditions. A very simple light model for transmission through mature trembling aspen (*Populus tremuloides Michx.*) crowns and through boles near forest edges was developed to account for the effect of light receipt on cone production. The enhanced light near forest edges (e.g., recent clearcuts) leads to about a doubling of cone production for subcanopy stems. The minimum subcanopy height for cone production far from an edge is about 10 m for balsam fir and 14 m for white spruce, with these minima decreasing near edges. By contrast, the minimum height for white spruce in a plantation (full light) is about 3 m. Accounting for light receipt leads to an increase in the explained variance.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Ellesmere Island, Nunavut.

02-036 LAVOIE, C., ALLARD, M., and HILL, P.R. (2002). "Holocene deltaic sedimentation along an emerging coast: Nastapoka River delta, eastern Hudson Bay, Québec". NRC Research Press, http://cjes.nrc.ca, April 11, 2002.

ABSTRACT/DESCRIPTION:
Eastern Hudson Bay is characterized by falling relative sea level as a result of post-glacial isostatic rebound, which makes the region a natural laboratory for rapid forced regression, where the evolution of deltaic systems and offshore sedimentation patterns can be studied. A multidisciplinary approach involving airphoto analysis, offshore geophysical surveys, sediment coring, and facies and

diatom analyses was used in this study of the Nastapoka River delta. The delta has formed as a result of the fluvial erosion of emerged Quaternary sediments but is mainly subaqueous. Offshore, in the prodelta zone, the oldest deposits are glaciomarine, laid down when the ice front of the receding Laurentide icesheet stood on the Nastapoka hills some 7700–6800 years BP. Lateral equivalents of this glaciomarine unit are presently exposed on land. The shallow-water platform of the delta shows a thin surficial unit of wave-worked sand that overlies fine-grained, deeper water deposits derived from erosion of clay soils in the river catchment a few centuries ago, probably during periods of intense thermokarst activity. As the isostatic uplift continues, the deltaic platform will gradually emerge and be incised by the river channel.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Northern Québec.

02-037 PIRAUX, O., FORTIER, D., et ALLARD, M. (2002). A 1.8 million(?) years old forest on Bylot Island. Conférence publique du Sirmilik Naitonal Park, Pond Inlet, Nunavut, juillet 2002.

RESUMÉ/DESCRIPTION:
La présentation illustre et commente un site fossilifère datant probablement du Pliocène ou du début du Pléistocène. L'unité stratigraphique est riche en bois, en restes végétaux et en restes d'insectes fossiles. Elle représente un écosystème boréal comme il en existe maintenant quelques 2000 km au sud de la région étudiée. Un till sons l'unité indique que, déjà, a cette époque, le site avait connu au moins une glaciation.

DISCIPLINE: Sciences de la terre.

LIEU DU TRAVAIL SUR LE TERRAIN: Ile Bylot, Nunavut.

02-038 MAINGUY, J., BÊTY, J.., GAUTHIER, G. and GIROUX, J.F.(2002). "Is the body condition of laying Greater Snow Geese and their reproduction affected by the spring conservation hunt?". Condor, 104:156-161.

ABSTRACT/DESCRIPTION:
A spring hunt was implemented on the staging areas of Greater Snow Geese (*Chen caerulescens atlantica*) in Québec in 1999 and 2000. We evaluated whether this activity, which occurred during the period of spring nutrient storage, may have affected the body condition and reproductive effort of laying geese. We collected laying females in years with a spring hunt (1999–2000, n 5 34) and compared them with birds collected in years without a hunt (1989–1990, n 5 10). All indices of body condition and clutch size were significantly lower in years with a hunt than in years without, and laying dates were delayed. Tracking of radio-marked females on the staging and breeding areas showed that a lower proportion of females reached the nesting areas in years with a hunt (28% in 1999–2000, n 5 80) than in years without (85% in 1997–1998, n 5 80) and that fewer females nested

(9% vs. 56%, respectively). Our results suggest that the spring hunt negatively affected nesting geese.

DISCIPLINE: Animal Ecology.

FIELDWORK LOCATION: Bylot Island, Nunavut.

02-039 MORIN, A. (2002). Social integration and social problems among Canadian Inuit: Theory and Hypothesis. Oral presentation, Second Seminar of the Work Group on Contemporary Inuit Values (CIV), Kuujjuarapik (Nunavik), October 27, 2002.

ABSTRACT/DESCRIPTION:
This PhD focuses on the sociological determinants of social problems in the Canadian Arctic. The social problems I am referring to are criminality, delinquency, suicide, substance abuse and violence. One way of understanding such realities, is to observe solidarity practices, as outlined in the theoretical literature through the concept "social integration". I have chosen 2 indicators of solidarity: social support networks, and the general participation of individuals in their society. Studies has shown that social support directly affects, positively or not, social problems (Snapp 1989 ; Lechasseur 1989). About the same relations link social problems to individuals' social participation (in its political, economic and cultural dimensions), has mentioned in recent researches on the notion of "social capital" (Putnam 2001 ; Kawachi and Berkman 2000). These concepts also apply to the Canadian Inuit situation. As early as the 1960', Balikci found that the weak social integration of Inuit was one of the main source of suicide (Balikci 1960). Recently, Elias (1996) illustrated .that a lack of job opportunities (economic participation) leads to an increase of social problems in Canadian aboriginal communities. The rapid changes that Inuit have experienced in the last 50 years has disturbed their 'social networks, resulting in many social problems (Robert-Lamblin 1993). Still, there is no adequate answers to these issues, because the contemporary ways in which Inuit renew their social ties and the factors which affect these ties are not enough documented, on the empirical level. I will answer these research questions using the results of interviews conducted in Nunavut (Pond Inlet and Iqaluit), with selected health professionals (social workers, nurses, doctors, psychologists), other people dealing with health issues (homeless and woman shelters), along with individuals of different age, sex and occupation.

DISCIPLINE: Sociology.

FIELDWORK LOCATION: Nunavut.

02-040 OTIS, G. et THÉRIAULT, S. (2002). La sécurité alimentaire durable des Inupiat et la protection juridique de l'accès aux ressources halieutiques et cynégétiques en Alaska. Symposium international sur la sécurité alimentaire, Univeristé Laval, Québec, Québec, 14-15 novembre, 2002.

RESUMÉ/DESCRIPTION:

La sécurité alimentaire durable existe lorsque chaque individu a accès a une nourriture saine, suffisante et nutritive lui permettant de satisfaire ses besoins énergétiques et ses préférences alimentaires pour mener une vie active et saine. Chez les Inupiat, l'atteinte d'un tel état est favorisée par la pratique des activités traditionnelles liées au prélèvement, a la transformation, au partage et a la consommation des ressources halieutiques et cynégétiques. Le droit contribuera a la sécurité alimentaire durable des Inupiat en garantissant l'accès aux ressources halieutiques et cynégétiques. Le cadre juridique optimal de la protection de la subsistance doit d'abord reconnaître des droits d'accès effectifs aux ressources du terroir. II doit en outre offrir des garanties aux droits d'accès aux ressources halieutiques et cynégétiques. Plusieurs dimensions du régime juridique de l'Alaska encadrant l'accès des autochtones aux ressources halieutiques et cynégétiques représentent une menace significative a la sécurité alimentaire durable des Inupiat. Entre autres, les activités de chasse et de pêche sont régies par deux systèmes juridiques distincts, l'un étatique et l'autre fédéral, en fonction du titre de propriété sur les terres. Ce système impose des contraintes importantes aux usagers et représente une source importante d'insécurité juridique.

DISCIPLINE: Droit.

LIEU DU TRAVAIL SUR LE TERRAIN: Alaska.

02-041 RETAMAL, L. and WARWICK, V.F. (2002). CDOM effects on aquatic photosynthesis, in the coastal Arctic Ocean: Trade-offs between UV protection and competition for PAR. 30th Annual Meeting of the American Society for Photobiology, Québec, Québec, July 13-17, 2002.

ABSTRACT/DESCRIPTION:
Coastal environment in the Arctic Ocean are strongly affected by the input of freshwaters because of the large rivers which discharge from circumpolar land masses. These waters are rich in CDOM that are likely to vary with changes in climate. CDOM protects phytoplankton against UV radiation because of it spectral absorption, and riverine CDOM have a UV absorption that is 10 to 150 time greater than marine CDOM (Carder et al. 1989 Limnol. Oceanogr.34:68-81). However CDOM absorbs strongly in the most efficient waveband for photosynthesis (Markager and Vincent 2000 Limnol. Oceanogr. 45:642-650). We evaluated these effects using a variety of models. Spectral attenuation was estimated by equations derived from previous work in the Hudson Bay (Laurion et al 1997 Photochem. Photobiol. 65:107-114). The effects of CDOM on UV-inhibition of photosynthesis were examined using the index T* (weighted transparency; Gibson et al. 2000 Arctic 53: 372-82). The PAR effects were evaluated using a primary production model that incorporates temperature (Rae and Vincent 1998 J. Plankton. Res.20:1293-1312) and by an index of spectral matching (Ae; Markager and Vincent 2001. J. Plankton Res. 23: 1373-84). These modelling results will be validated by a series of bioptical measurements and experiments in Hudson Bay.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Rivière la Grande Baleine, Québec.

UNIVERSITY OF MANITOBA

02-042 MOCHACZ, N.J., REIST, J.D., LOW, G., and DITZ, K. (2002). Distribution and biology of Bull Trout populations in mountain streams of the central and southwestern Northwest Territories. Presentation: Canadian Conference for Fisheries Research and annual meeting with Canadian Society of Limnologists 2002 Annual Meeting, Empire Landmark Hotel, Vancouver, British-Columbia, January 3-5, 2002.

ABSTRACT/DESCRIPTION:
During the summer and fall of 2000–2001 fisheries surveys were completed in the Deh Cho and Sahtu regions of the Northwest Territories (NWT). Bull trout (*Salvelinus confluentus*) populations were found in the Liard (60°36.092'N, 124° 02.071'W), South Nahanni (61° 36'22.9'N, 124° 48'28.8 W), and Keele River (64°14.99'N, 125°59.74'W) watersheds. A linear discriminant function proven to be 100% effective in distinguishing bull trout from Dolly Varden (*S. malma*) (Haas and McPhail, 1991, Can J. Fish. Aquat. Sci. Vol. 48 pp. 2191-2211) was used to confirm the identity of the char captured. Repeated capture of bull trout over consecutive years at these sites indicate that self-sustaining populations occur in these areas. Growth, age, sexual maturity, and feeding habitats are summarized for populations from various streams throughout the region. Ages for all individuals were determined using thin sections from otoliths and pelvic fin rays. Preliminary data show that stream resident, fluvial and adfluvial life history types occur in the region. Results from the study suggest that populations found throughout these watersheds are relatively small, widely dispersed, and exhibit meta-population structure. The demonstrated sensitivity to perturbation displayed by bull trout populations in other areas, the presence of what appear to be small widely dispersed populations, and the existing and anticipated level of industrial development in the NWT present significant conservation and management challenges in the area.

DISCIPLINE: Life Science.

FIELDWORK LOCATION: Sahtu and Deh Cho regions of the Northwest Territories.

02-043 MUNDY, C.J., MICHEL, C. and BARBER, D.G. (2002). The development of an ice algae bloom in relation to the optical properties of a changing snow and first-year sea ice cover near Resolute, Nunavut. 2nd DFO National Science Workshop, The Bayfield Institute, Burlington, Ontario, November 21, 2002

ABSTRACT/DESCRIPTION:
A detailed bio-physical dataset was collected during late spring 2002, near Resolute Bay (Nunavut), to examine the relationship between a bottom ice algal bloom and radiative transfer through the atmosphere and snow. Results demonstrate that snow cover spatial (on the order of meters) and temporal variability results in complex trends of ice algal biomass. Ice algal chlorophyll a (chi a) under low snow depths (< 6cm) showed a significant seasonal decrease, which corresponded to an ablating snow cover and increased light availability. Under intermediate snow depths (6 - 20cm), bottom ice chi a concentrations decreased slightly at the end of the sampling period. Maximum chi

a values were observed at intermediate snow depth. Under high snow depths (> 20cm), bottom ice chi a concentrations were correlated with snow depth but did not show any seasonal trend. These results suggest that the overlying snow cover significantly affects ice algae biomass, however, this relationship is complex and may involve other factors not accounted for in this preliminary analysis. Under the context of a C02 enhanced atmosphere we expect changes in both the magnitude and temporal distribution of precipitation. Assessment of the effects of these physical changes on algal biomass is an ongoing objective of this research.

DISCIPLINE: Bio-physical Geography.

FIELDWORK LOCATION: Resolute Bay, Nunavut.

McGILL UNIVERSITY

02-044 DABROS, A. (2002). Niche differentiation among closely related peatland Carex species. Meeting Abstract: Sedges 2002: An International Conference on Cyperaceae, Delaware State University, Dover, DE, June 6-8, 2002.

ABSTRACT/DESCRIPTION:
The traditional approaches to explaining the structure of plant communities and coexistence of plant species include the theory of limiting similarity, which states that there is a limit to the degree of niche overlap and similarity of resource use in sympatric species. Segregation even on a single environmental gradient may suffice for reducing or even eliminating the competition between the species. We collected data on co-occurrence patterns and distribution in relation to environmental gradients of water depth and pH fro 29 Carex species in the peatlands of the Schefferville region, Québec (54'47°N, 66'50°W). Response surface analysis indicates that two closely related species, *C. Limosa* and *C. paupercula* do not separate on the pH axis, as they are both pH generalists, however they separate on the depth axis, leading to a low co-occurrence of these species (2.5%). Another pair of close relatives, *C. rostrata* and *C. utriculata*, do not show obvious separation on either depth or pH gradient according to response surface analysis, however, detrended correspondence analysis indicates that the presence of *C. rostrata* occurs in plant communities characterized by deeper water in comparison to *C. utriculata*.

DISCIPLINE: Botany.

FIELDWORK LOCATION: Schefferville, Québec.

02-045 MISKOVIC, A., FRANCIS, D. and HART, C. (2002). Eocene Magmatism in the SW Yukon: The Sifton Range volcano complex. 30th Yukon Geoscience Forum, Yellowknife, Northwest Territories, November 22, 2002.

ABSTRACT/DESCRIPTION:
The eastern margin of the Coast Plutonic Belt (CPB) in the south-west Yukon, where uplifted plutons are in direct contact with the coeval volcanic equivalents, represents an exceptional natural laboratory for examining the relationship(s) between calc-alkaline volcanic sequences and subduction-related granitoid plutons. This study investigates the relationship(s) between volcanic rocks of the Sloko-Skukum Group located in the Sifton Range, coeval granitoid intrusions of the south-west Yukon and crosscutting mafic dykes. In addition to formulating a magmatic model for evolution of the Coast Plutonic Complex (CPC), it is an attempt to constrain the amount of crustal uplift in the SW Yukon since the early Tertiary times. Partially invaded by intrusives of the CPB, the Sifton Range Volcanic Complex (SRVC) represents the last major volcanic package along the north-west trending "Sloko-Skuktun line". Preliminary results indicate the presence of three distinct effusive-explosive sequences, dominated by flow banded or massive, heterogeneous, pumice-rich intermediate to felsic tuffs, heterolithic tuff breccias, and ignimbrites. Adjacently, the Ruby Range batholith is characterized by two intrusive phases - the early amphibole, pyroxene quartz

monzodiorites and tonalites followed by biotite-bearing quartz monzonite, and granites. Invading pluton imposed structural control on the volcano-stiatigraphy by a 5-13 degree north-westerly tilt.

DISCIPLINE: Geology.

FIELDWORK LOCATION: The Sifton Range, Yukon.

02-046 **MODELand, S. (2002).** Paleoproterozoicm magmatism in central Baffin Island, Nunavut. Geological Association of Canada Annual Meeting, Saskatoon, Saskatchewan, May 27-29, 2002.

ABSTRACT/DESCRIPTION:
Paleoproterozoic picrites to tholeiitic basalts, related ultramafic and mafic sills and amphibolite-facies sediments within the Piling Group of central Baffin Island are collectively referred to as the Bravo Lake Formation. Lithochemical results indicate the existence of three chemically distinct magma types. Type 1 magmas constitute the volcanics of the lower volcanic unit and are characterized by relatively low FeO, low trace-element contents and have moderately fractionated REE-profiles (La/Lu varies from 1.5 to 3.2). Type 2 magmas occur in the upper volcanic unit, they are poorer in Si, richer in Fe, than type 1 magmas and have higher trace element contents and significantly more fractionated REE-profiles (La/Lu varies from 13-27). Type 3 magmas also occur predominantly within the same stratigraphic sequence as type 2 and may be a subset of type 2 magmas since they have similar FeO contents and fractionated REE-profiles, but have greater Nb, Zr, Ti, and P contents.

DISCIPLINE: Geology.

FIELDWORK LOCATION: Baffin Island, Nunavut.

02-047 **NEWBURY, T.; TITMAN, R.D. and ROBERTSON, G. J. (2002).** Effects of low-level overflights on the behaviour of spring staging waterfowl. Waterfowl Conference, Happy Valley - Goose Bay, Newfoundland, September 17-18, 2002.

ABSTRACT/DESCRIPTION:
Lac Fourmont, Labrador (latitude 52° 03' 30", longitude 60° 31' 01"), was chosen as the study site for the 2002 field season. Lac Fourmont is seen as a good study site for studying the effects of low-level overflights on the behaviour of spring staging waterfowl for the following reasons: (1) there is a known ashkui previously identified by Innu (2) it is a known staging ground for a large variety of waterfowl, and (3) it is a widely overflown area by low-level flying jets training in the Military Training Area of the Québec-Labrador Peninsula..

DISCIPLINE: Environmental Sciences / Ecology.

FIELDWORK LOCATION: Lac Fourmont, Labrador.

02-048 ROY, C. (2002). Territorial conflict-resolution in the Central Highlands of Iceland. The 2nd NARP symposium "The Arctic in the Anthropocene: The North Atlantic Arctic in Focus", Akureyri, Iceland, May 23-24, 2002.

ABSTRACT/DESCRIPTION:

The traditional property rights which communities and the debate define over resource and land ownership could be causes elements in the comprehension in environmental conflicts. In Iceland, problems were arises with regard to the various objectives relating to nature conservation because property rights, interest in the area and/or claim traditional user rights. In the recent debate over the large-scale industries and conservation of natural resources in the central highlands it is often forgotten that actual ownership of the land and rights to utilization are far from clear. This regional planning has created similar conflicts that can also be found in the James Bay Territory over the rights of resource-uses between local resource users and external development forces established by the government, private or public companies and environmental groups. How to resolve the debate over ownership between industrial development and natural conservation in the central highlands with respect to unresolved community land tenure claims? I will using methodology of relation between the state land tenure policy and the responses of local communities to analyse the potential limitations in access of lands resource-use and property rights in the study area.

DISCIPLINE: Human Geography.

FIELDWORK LOCATION: Akureyri, Iceland.

02-049 **LOCKE, S.** **(2002)**. "Hardy northern plants have valuable secrets." Your Yukon , (www.taiga.net/yourYukon/col280.html), Column 280.

ABSTRACT/DESCRIPTION:

Even with its dainty crown of white flowers, it would be easy to overlook the little plant growing by the side of the Alaska Highway. The non-botanist might describe *Thellungiella salsuginea* -- commonly known as salt lick mustard -- as, well, rather innocuous. But this plant is so unique that two biologists have travelled all of the way from Ontario to study it in its native environment. What's more, they think that this plant could hold clues that could help increase yields on commercial crops like canola. The salt lick mustard is a true hardy northerner. It can survive droughts and freezing, and -- true to its name -- thrives in salty conditions.

DISCIPLINE: Botany.

FIELDWORK LOCATION: Takhini Salt Flats, Alaska.

MEMORIAL UNIVERSITY

02-050 GOUDIE, R.I. (2002). Effects of aircraft disturbance on behaviour of Harlequin Ducks breeding in central Labrador. Poster Presentation, ACWERN Eighth Annual Meeting, Bonne Bay Biology Station, Rocky Harbour, Newfoundland, October 31 to November 3, 2002.

ABSTRACT/DESCRIPTION:
As part of a multi-year study of the behavioral ecology and demography of Harlequin Ducks (Histrionicus histrionicus) breeding in central Labrador, I studied the response of individually marked pairs of Harlequin Ducks to noise generated from low-level military jet over-flights at Fig River, a tributary of the Lower Churchill River in central Labrador. I applied a Before After Control Impact (BACI) study design to substantiate impacts on behaviours of individual birds in the Military Training Area. Harlequin Ducks responded to jet noise with Alert behaviours, and there was a positive dose-response relationship. Responses varied individually, and residual effects were linked with decreased courtship and increased agonistic behaviours. In successive over-flight treatments, initial startle responses frequently waned, and in some cases there were no detectable responses by the third or fourth successive over-flight, suggesting short-term habituation. Direct behavioural responses to military jet over-flights were of short duration, and unlikely to affect critical behaviours, such as feeding and resting, in the overall time-activity budgets of breeding pairs. Implications of residual effects on behaviour warrent further investigation. The study objective of the original 5-year proposal will address the physiological implications of aircraft noise treatment to body condition and survival of Harlequin Ducks breeding in the Military Training Area of central Labrador.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Fig River, Labrador.

02-052 MAJOR, H.L. and JONES, I.L. (2002). "Impacts of the Norway Rat on the Auklet breeding colony at Sirius Point, Kiska Island, Alaska in 2002". Internet article, http://www.mun.ca/acwern/KiskaRAT2002.pdf

ABSTRACT/DESCRIPTION:
Introductions of alien organisms have been the root of many ecological problems, the most notable of which occur on island flora and fauna. During World War II Norway Rats were introduced onto Kiska Island, Alaska. We measured reproductive success of Least and Crested Auklets in relation to predation by introduced Norway Rats at Sirius Point, Kiska Island, Aleutian Islands, Alaska in 2001 and 2002. As an omnivore and predator of burrow and crevice nesting seabirds, the Norway Rat has been known to cause the declines, extirpations and even extinctions of island avifauna and is therefore a threat to the seabirds at Kiska. Intense rat predation of auklet adults, eggs and chicks was observed during 2002. Overall reproductive success was 10% (13% in 2001), the lowest ever measured in any year at any Least Auklet colony. Breeding failure resulted from predation, parental neglect and chick starvation. Although the Sirius Point auklet colony is large (> 1,000,000 birds), its future is uncertain. Kiska Island is part of the Alaska Maritime National Wildlife Refuge

(AMNWR)

DISCIPLINE: Conservation Biology.

FIELDWORK LOCATION: Kiska Island, Alaska.

02-053 RENNER, M. (2002). Gull predation as a factor in the evolution of plumage variation of Least Auklets (*Aethia pusilla*). Poster Presentation, Atlantic Canada Wildlife and Ecology Network, Eighth Annual Meeting, Bonne Bay Biology Station, Rocky Harbour, Newfoundland, October 31 to November 3, 2002.

ABSTRACT/DESCRIPTION:
Least Anklet (*Aethia pusilla*), probably the most abundant seabird in the Bering Sea, displays an unusual amount of polymorphism in its breeding plumage. Predation pressure by Glaucous-winged Gulls (*Larus glaucescens*) could be a driving force behind the evolution of Least Anklet plumage polymorphism. To test whether gulls have a preference for a certain plumage type I performed an experiment in which I observed gull attack rates on manipulated models. Gulls might prefer a plumage type because it is easier to detect, provides a better meal, or because it is correlated with an auklet's ability to escape during an attack. Acceleration during take-off of captured auklets was measured from videotape using digital single frame analysis. I will discuss the potential of take-off acceleration as a cheap measure of a bird's condition.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Buldir Island, Alaska.

UNIVERSITY OF NEW BRUNSWICK

02-054 **DESLIPPE, J. and EGGER K.N. (2002).** Impacts of climate change on nitrogen fixing microbial communities in the Canadian High Arctic. Poster Presentation, 32rd International Arctic Workshop, INSTAAR, University of Colorado at Boulder, Boulder, Colorado, March 14-16, 2002.

ABSTRACT/DESCRIPTION:
Many terrestrial arctic ecosystems are strongly nitrogen limited. Nitrogen-fixing bacteria (*diazotrophs*) are important regulators for plant productivity at these sites. Global warming may alter selective pressure on bacterial communities causing changes in bacterial diversity and community structure and results in sustained alteration of the nitrogen budget for plants. The objectives of my research are to examine the diversity and community structure of diazotrophic communities under conditions of simulated climate change in the Canadian high arctic and to examine nitrogen inputs from the communities. A nested PCR protocol will be used to amplify nifH gene sequences from bulk DNA extracted from soils of warmed and fertilised plots from a mesic site at Alexandra Fjord, Ellesmere Island, Nunavut. Terminal restriction fragment length polymorphisms (-RFLPs) will beused to analyze the diversity of nifH gene sequences from each treatment. Concurrently, measurements of nitrogen fixation will be made by the acetylene reduction and the 15N methods. NifH gene diversity will be related to the rate of nitrogen fixation.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Ellesmere Island, Nunavut.

02-055 **SWYSTUN, H.A.; DAWSON, R.D. and HINES, J.E. (2002).** Reproductive ecology of Tundra Swans in the Mackenzie Delta Region. Poster Presentation, 3rd North American Ornithology Union Conference, New Orleans, Louisiana, September 24-28, 2002.

ABSTRACT/DESCRIPTION:
Tundra swans are sensitive to disturbance and are used to monitor development impacts in the Mackenzie Delta, Northwest Territories, Canada. Few scientists have studied the breeding habits of tundra swans and this information will improve population management. Objectives of this study are: (1) establish monitoring plots for tundra swans at "control" and "development" sites; (2) document nesting success and brood survival; and (3) determine factors limiting reproductive success. In 2001, monitoring plots (5X5km) were established in the delta, 20 plots related to gas and oil development and 20 as random control plots. Plots were surveyed by helicopter to count all swans (798) and nests (86) in June of 2001. Surveys were repeated in August to count adult swans (729) and young produced (<7% of the late summer population). Clutch initiation dates, clutch size (3.2 +/- 0.2), and egg size were quantified at 19 nests that were visited prior to hatching. Fifty-two nests were revisited after hatching to estimated nest success (72%) and causes of nest loss. A late spring resulted in low nesting effort. Brood loss after hatch was significant and we recommend future studies focus on brood survival.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Inuvik, Northwest Territories.

UNIVERSITY OF OTTAWA

02-056 **BOUCHARD, G., GAJEWSKI, K., and HAMILTON, P. (2002).** Limnological trends of lakes across the Canadian Arctic Archipelago and their relationship to diatom biogeography. Poster presentation, 17th International Diatom Symposium, Ottawa, Ontario, August 25-31, 2002.

ABSTRACT/DESCRIPTION:
Limnological characteristics of over 150 lakes spanning across the Canadian Arctic Archipelago are studied using spatial analysis in a Geographical Information System (GIS) to see possible spatial relationships and trends in relation to bedrock geology. These data represent a compilation of results from several research groups including those collected by the authors from various regions across the Arctic. Spatial mapping of conductivity shows values were lowest in the southeastern portion of the Arctic where many of the sites are situated on intrusive and metamorphic bedrock types. Dissolved inorganic carbon (DIC), pH, and calcium are shown to have similar spatial trends. This spatial analysis will be used to investigate relationships between the limnological variables and diatom species distribution and assemblage composition. Surface sediments from a selection of lakes will be analysed for diatom community composition. Species distribution and diversity will be investigated and the roles various environmental variables have in determining composition changes on a spatial scale will be examined. Changes in species diversity and distribution are expected to be associated with the limnological trends. By investigating these trends over this large geographic area we can improve our understanding of the biogeography and ecology of diatoms.

DISCIPLINE: Paleolimnology

FIELDWORK LOCATION: Canadian Arctic

02-057 **BUNBURY, J. and GAJEWSKI, K. (2002).** Seasonal and temporal variability of the physical, chemical, and biological parameters of Kluane Region Lakes, southwest Yukon Territory, Canada. Poster presentation, Canadian Association of Geographers 2002 Annual Meeting, University of Toronto, Toronto, Ontario, May 30, 2002.

ABSTRACT/DESCRIPTION:
This study investigated the seasonal cycle of physical, chemical and biological parameters of five lakes in the Kluane Lake Region of the southwestern Yukon. The spatial and temporal variability of temperature, dissolved oxygen, specific conductance, pH, total phosphorus (TP), total Kjeldahl nitrogen (TKN), chlorophyll a, and water clarity were measured at twelve intervals from May to August, 2001. Lakes greater than 7 metres exhibited thermal stratification, where lake size and topography affected the depth of the thermocline. Nutrients fluctuated considerably from lake to lake, yet TP and TKN decreased through the season in the more productive lakes. Lakes were oligo-mesotrophic to meso-eutrophic based on average TP values (8 to 25 tg/L). Among all of the lakes, significant positive correlations exist between TP and chlorophyll a, and significant negative correlations exist between Secchi depth and chlorophyll a. Outliers often influenced correlations and regressions, where regressions were usually invalid. Average values of TKN and chlorophyll a over

the course of the summer are not always higher than point samples, where average values of TP are.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Southwest Yukon.

02-058 **EDNIE, M. and LEWKOWICZ, A.G. (2002).** Evaluation of the basal temperature of snow (BTS) method to map mountain permafrost, Wolf Creek, Y.T. Poster presentation, Annual Meeting of the Canadian Association of Geographers – Ontario Division, University of Western Ontario, London, Ontario, October 25-26, 2002.

ABSTRACT/DESCRIPTION:
The basal temperature of snow (BTS) method, used to map mountain permafrost in the European Alps, was evaluated in Wolf Creek, southern Yukon Territory, Canada. The Wolf Creek watershed is a 185km^2 basin with complex terrain, situated -20 km south of Whitehorse, Yukon (60°30'N, 135°13'W). A map of BTS values for the basin was developed based on the relation between incoming solar radiation, elevation and 239 BTS values collected in April 2001 and 2002. Two hundred geo-referenced pits were excavated between late July and August 2002 at altitudes of 1188 m to 2078 m a.s.l. These were used to measure or estimate the depth to frost table (if any), and the organic mat thickness. Soil characteristics and vegetation were also described. Preliminary results indicate a continuous distribution of permafrost at BTS values < -6°C. The probability of permafrost decreases to 25% at -1 °C BTS. An organic mat thicker than 10 cm was associated with the presence of permafrost across a wide range of elevations. Conversely, locations with thin organic mats experienced a wider variety of permafrost and non-permafrost conditions.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Wolf Creek, Yukon.

02-059 **KINNARD, C. and LEWKOWICZ, A. (2002).** Radiocarbon dating of 12 solifluction lobes near Outpost Mountain, Yukon. Poster presentation, Annual Meeting of the Canadian Association of Geographers – Ontario Division. University of Western Ontario, London, Ontario, October 25-26, 2002.

ABSTRACT/DESCRIPTION:
Buried humus samples were collected at solifluction lobes for radiocarbon dating and determination of long-term rates of lobe advance on a west-facing slope of an alpine plateau. The dates obtained from twelve of these lobes, which have varying sizes and positions on the slope, are presented and discussed. The ages of samples obtained at 1 and 2 metres behind the fronts of the lobes are not fully concordant among the forms. In some cases, overlapping ages were found at 1 and 2 metres back from the front, and at the base of the modern organic mat in front of the riser, suggesting a rapid advance of the lobe front over the parent slope. The presence of shear planes inside the lobes and

sometimes of silty horizons ahead of the front, is also suggestive of a mechanism for lobe advance which involves a critical accumulation of soliflucted material behind the riser, break-up of the front, and rapid burial of the organic mat by slumping and/or colluviation. Therefore, lobes across the study slope represent different stages of this cycle, and inter-lobe comparison and climatic interpretation of changing rates must deal with lag times from episodic frontal movement.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Kluane Range, Yukon.

02-060 **LESOTO, L.L.; SICILIANO, S.D. and LEAN, D.R.S. (2002).** " Methyl mercury in High Arctic Wetlands". Environmental Toxicology and Chemistry., 23(1):17-23.

ABSTRACT/DESCRIPTION:
Mercury in the High Arctic is present at high levels in wildlife and Inuit people. Since methylmercury (MeHg) accumulates in food chains, the source of MeHg requires study. In temperate environments wetlands are MeHg sources, with formation occurring via Hg(II) conversion to MeHg by sulfate reducing bacteria (SRB). This study investigated if High Arctic wetlands produced MeHg and if SRB were responsible for MeHg formation. Frozen soil was collected from 18 wetlands (16 on Comwallis Is., one on Sommerset and one on Bylot Island, NT) prior to ground thaw and analyzed for MeHg and total Hg. To simulate summer conditions, soils were incubated for 30 and 60 days at typical summer arctic soil temperatures (4°C and 8°C) and rates of MeHg formation determined. Results revealed that MeHg in frozen soil were low averaging 0.3 mg kg-1, but rapidly increased to 6.5 mg kg-1 after 30days at 4C, before declining to 3.5 mg kg-1 after an additional 30 days at 8C. Water samples were collected from the surface of a wetland that was fed by snowmelt during the growing season to examine the MeHg levels. The wetland was sampled at the inflow, middle and outflow during July. MeHg values in wetland water increased from 21 pg L-1 at the entry to the wetland to 1500 pg L-1 at the exit. Despite MeHg increases, SRB prevalence was low and DNA analysis was positive for SRB at only two of the 18 sites. Our results show that wetlands in the High Arctic produce high levels of MeHg during the Arctic summer but the mechanism of formation is unclear.

DISCIPLINE: Environmental Science / Ecology.

FIELDWORK LOCATION: Resolute Bay, Nunavut.

02-061 **POITEVIN, J., MERCIER, G. and LAURIOL, B. (2002).** Monitoring ice margins with Leica laser technology. Presentation, Parks Canada Annual Meeting 2002 - IF, IT and GIS, Victoria, British-Columbia, November 5-7, 2002.

ABSTRACT/DESCRIPTION:
Purpose: Our objectives for the summer 2002 were to map glacier margins and

hydrogeomorphological changes. The results will provide some direction in the creation of a mid- to long-term monitoring protocol for glacier fluctuations. The proposed monitoring framework could be used in the future to assess and determine the impact of climatic change employing a combination of conventional remote sensing image analysis techniques. **Field Methodology:** A total of eight (8) glacier ice margins were measured from a fixed benchmark. To complement conventional remote sensing techniques (satellite images), a Leica Rangefinder Laser Locator was used for mapping glacier margins. At each monitoring site the following methodology for data collection was followed: (1) all stations are situated between 200-820 meters from glacier margins, (2) proper station selection (i.e. accessibility, stabilization, repeatability, etc.), (3) data capture for distance, azimut and elevation angles and (4) GPS reading at monitoring station for periodic observations (option to couple rangefinder with a GPS). Special attention in selecting glacier margins should be brought to areas masked with clouds and shadows on the satellite image. In situ measurements can help in supplying missing information. **Conclusion:** This monitoring protocol using in situ equipment is simple to implement in Arctic parks. The logistical and field work can be combine with other on-going monitoring programs. The frequency of measurement should be varied on a 3-5 years cycle.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Akshayuk Pass, Auyuittuq National Park, Nunavut.

02-062 VAN BRABANT, R.A. and LEWKOWICZ, A.G. (2002). Preliminary findings regarding sediment transfer on fans at the base of an alpine ridge, Kluane Range, Yukon, Canada.. Presentation, Special CGRG Session, Annual Meeting of the Canadian Association of Geographers – Ontario Division, University of Western Ontario, London, Ontario, October 25-26, 2002.

ABSTRACT/DESCRIPTION:

The north-face of an alpine ridge near Kluane Lake, Yukon Territory was subjected to 36 mm of rain in the form of heavy showers and periods of lighter persistent rainfall from 15-17 July 2002. The precipitation intensified on the evening of 17 July with 25-30 mm of rain falling between 1730 and 2100 hrs. Grab water samples from channels bisecting fans at the base of the ridge taken immediately following the rainstorm had suspended sediment concentrations of 4600 to 30,000 mg/L. Flows were estimated to be 70 to 150 L/s at the time of sampling. In contrast, samples gathered before the storm had levels of suspended sediment so low they were almost negligible. The geomorphic influence of stream channels engorged by the rainfall was considerable with significant downcutting and avulsion of flow. Stream channels were observed to multiply and oscillate in a matter of minutes and significant clasts (up to 15 cm) were transported as bedload. These findings highlight the potential importance of rainstorms for sediment transfer in this alpine area. More detailed investigations will take place in 2003 in an attempt to establish the relative importance of snowmelt, summer rainstorms, and mass movement processes on the fans.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Kluane Range, Yukon Territory.

02-063 ZDANOWICK, C.; FISHER, D.; CLARK, I.D. and LACELLE, D. (2002). "An icemarginal δ^{18}record from Barnes Ice Cap, Baffin Island, Canada". Annals of Glaciology, 35:145–149.

ABSTRACT/DESCRIPTION:
Barnes Ice Cap (Baffin Island) is a remnant of the Laurentide ice sheet that separated from it about 8500 yr ago. Owing to recession of the ice cap during the Holocene, Pleistocene-age ice is now exposed along the margin in a distinctive bubblerich white band. δ^{18} variations across the white ice resemble those in Canadian Arctic cores, suggesting that the Barnes Ice Cap preserves a climatic record through the last glacial period, possibly reaching back into the previous (Sangamon) interglacial. The δ^{18} shift at the Wisconsin-Holocene transition (15%o) exceeds that in other Canadian and Greenland records and cannot be explained solely in climatic terms. A steady-state model reconstruction of the Laurentide ice sheet during the Last Glacial Maximum suggests that late glacial strata in Barnes Ice Cap originated high up (>2400m asl) and far "inland" on the ice sheet, along a ridge that extended between the ancestral Foxe and Keewatin ice domes.

DISCIPLINE: Glaciology.

FIELDWORK LOCATION: Baffin Island, Nunavut.

QUEEN'S UNIVERSITY

02-064 **BEIRLE, B.D., LAMOUREAUX, S.F., COCKBURN, J.M.H. and SPOONER, I. (2002).** "A new method for visualizing sediment particle size distributions". Journal of Paleolimnology, 27:279-283.

ABSTRACT/DESCRIPTION:
Conventional uses of sediment grain size data as a proxy for paleoenvironmental processes are usually restricted to simple statistical descriptions of the particle size distribution (PSD) (e.g., mean, median and mode). These descriptions provide a generalized indication of down-core changes in depositional conditions and processes, but are not sensitive to a non-normal or polymodal distributions. In contrast, surface plots of grain size data allow qualitative interpretations of the characteristics of the entire PSD and thus can provide important insights into depositional processes and changing environmental conditions. This method is especially useful for distinguishing multiple sediment processes, which can appear as additional modes within the PSD. In general, this approach can be used on sediments from most depositional environments and at any spatial or temporal resolution. In combination with conventional summary statistics, PSD surface plots increase the potential utility of grain size as a paleoenvironmental proxy for identifying changes in clastic and organic depositional processes in lake sequences.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Yukon Territory.

02-065 **GREGORY-EAVES, I., DOUGLAS, M.S.V. and SMOL, J.P. (2002).** "Fisheries productivity in the northeast Pacific over the past 2,200 years". Nature, 416: 729-733.

ABSTRACT/DESCRIPTION:
Historical catch records suggest that climatic variability has had basin-wide effects on the northern Pacific and its fish populations, such as salmon, sardines and anchovies1–7. However,these records are too short to define the nature and frequency of patterns. We reconstructed ,2,200-year records of sockeye salmon abundance from sediment cores obtained from salmon nursery lakes on Kodiak island, Alaska. Large shifts in abundance, which far exceed the decadal-scale variability recorded during the past 300 years1–8, occurred over the past two millennia. A marked, multi-centennial decline in Alaskan sockeye salmon was apparent from, 100 BC to AD 800, but salmon were consistently more abundant from AD 1200 to 1900. Over the past two millennia, the abundances of Pacific sardine and Northern anchovy off the California coast, and of Alaskan salmon, show several synchronous patterns of variability. But sardines and anchovies vary out of phase with Alaskan salmon over low frequency, which differs from the pattern detected in historical records 5, 6. The coherent patterns observed across large regions demonstrate the strong role of climatic forcing in regulating northeastern Pacific fish stocks.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Kodiak Island, Alaska.

02-066 GREGORY-EAVES, I. (2002). Tracking past sockeye salmon (*Oncorhyncus nerka*) population dynamics in Alaska using paleolimnology. Ph.D. Thesis, Department of Biology, Queen's University.

ABSTRACT/DESCRIPTION:
Historical records for Pacific salmon reflect substantial variability. Great controversy exists over the causes, as climatic change and many anthropogenic factors, (e.g. commercial sighing, habitat alterations, hatcheries and dams) may have impacted salmon stocks. The main objectives of this thesis were to develop paleolimnological approaches to reconstruct past sockeye salmon population dynamics and apply these tools to infer trends in Alaska over the past ~2,200 years. (←/→) Overall, this thesis has demonstrated that paleolimnology can provide powerful insights into sockeye salmon population dynamics and the factors that affect adult production trends. This knowledge could, in turn, help to predict future sockeye salmon abundances and develop sustainable management plans for this species.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Kodiak Island, Alaska.

02-067 LAMOUREUX, S.F., GILBERT, R. and LEWIS, T. (2002). "Lacustrine sedimentary environments in high arctic proglacial Bear Lake, Devon Island, Nunavut, Canada". Arctic, Antarctic, and Alpine Research, 34(2):130-141.

ABSTRACT/DESCRIPTION:
Combined catchment, subbottom acoustic, and sedimentary studies of High Arctic, proglacial Bear Lake, Devon Island, were carried out to evaluate the role lacustrine processes and Holocene catchment evolution have had on the sedimentary record. In the proximal basin, bottom deposits up to 60 m thick are generated in part by turbid underflows associated with peak meltwater flow from the Devon Island Ice Cap. These underflows produce rhythmically laminated structures that are likely varves. In shallower locations, accumulation is slower and results from homopycnal distribution of fine suspended sediment throughout the proximal basin, resulting in a simple varve couplet. The distal basin is isolated from glacial meltwater by a shallow sill, although some fine-grained detrital carbonate transported by the glacial meltwater is deposited in both basins. In most locations in the distal basin Holocene sediments are less than 10 m thick. They are composed primarily of massive clay and some carbonate interrupted by irregular graded carbonate units produced by sporadic heavy summer rainfall and sediment transport from small plateau tributaries. Eolian sedimentation is also important throughout the lake, especially when high accumulations melt through the ice in the proximal basin, producing isolated grains and layers of coarse sand in the sedimentary record. Holocene ice margin changes have influenced the sedimentary record substantially, particularly during the mid-Holocene when the ice cap is inferred to have retreated from the catchment.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Bear Lake, Devon Island, Nunavut.

02-068 LEWIS, T., GILBERT, R. and LAMOUREUX, S.F. (2002). "Spatial and temporal changes in sedimentary processes at Proglacial Bear Lake, Devon Island, Nunavut, Canada". Arctic, Antarctic and Alpine Research, 34(2):119-129.

ABSTRACT/DESCRIPTION:
Lacustrine sedimentary processes are identified on an intra-annual scale at proglacial Bear lake, Devon Island. Stage recorders, recording thermistors, sediment traps, and underflow monitoring equipment were deployed during the 1999 melt season. Episodic proximal turbidity currents were measured as positive near-bottom temperature anomalies and currents. The timing of individual positive temperature anomalies was clearly associated with diurnal peaks of discharge into the lake. During the period July 23 to 25, continuous underflow occurred, which preceded a large discharge event by about 24 hr. Sediment traps placed throughout the lake recorded sediment accumulation rates from 16 June to 4 August. An extremely large precipitation event occurred on 29 June, when coarse, carbonate-rich sediment was deposited in front of a secondary tributary by spatially limited turbidity currents. A niveo-eolian deposit was observed on the lake ice, and sediment traps were deployed under this area. Mass accumulation rates in these traps locally overwhelmed fluvially generated sedimentation. This sediment was dominantly sand, which quickly melted through the lake ice and hastened the date of localized break-up.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Bear Lake, Devon Island, Nunavut.

UNIVERSITY OF SASKATCHEWAN

02-069 **HASZARD, S.L. and CLARK, R.G. (2002).** Habitat requirements of White-Winged and Surf Scoters in the Mackenzie Delta Region. 1st North American Sea Duck Conference, Victoria, British-Columbia, November 6-10, 2002.

ABSTRACT/DESCRIPTION:

In 1998 I was presented with an opportunity to fulfil a long-time dream: to work in the Arctic. This opportunity came in the form of a job offer from the Gwich'in Renewable Resource Board (GRRB) in Inuvik, Northwest Territories. Over the next two years, I worked on projects involving wildlife and forest management in the Gwich'in Settlement Area. It was during this time that I became interested in pursuing graduate work that would focus on waterfowl breeding in the Arctic. My thesis project developed in response to concerns voiced by the communities of Inuvik, Aklavik, Tsiigehtchic, and Fort McPherson. Gwich'in elders and hunters from these Mackenzie Delta communities had noticed a decline in the number of whitewinged scoters (Melanitta fusca) and surf scoters (*M. perspicillata*) returning to the area each year (Gwich'in Elders, 1997). Scoters, locally known as black ducks, are an important subsistence resource for Gwich'in people, so there was strong local support for a project focusing on these species of sea ducks. In September 2000, I began my M.Sc. program in Biology with Dr. Robert Clark at the University of Saskatchewan. My thesis work focuses on learning more about the habitat requirements of whitewinged and surf scoters in the Mackenzie Delta region.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Inuvik, Northwest Territories.

02-070 **HEATH, J.P and GILCHRIST, G. (2002).** Diving ecology of Common Eiders wintering at Polynyas in the Belcher Islands, Nunavut. Presentation, North American Sea Duck Conference and Workshop Victoria, British-Columbia, November 6–10 , 2002.

ABSTRACT/DESCRIPTION:

We deployed an underwater video camera to record diving and foraging by Common Eiders (*Somateria mollissima sedentaria*) wintering at the Belcher Islands, Hudson Bay, Nunavut. Although the majority of Hudson Bay is frozen over, strong tidal currents within the Belcher Islands produce polynyas, discrete areas of open water, within which eiders can access benthic prey. We obtained >200 focal video watches of complete dives at several locations within a polynya 10-15 m in depth. These videos provide details of descent, prey search and selection, ascent, and interactions between eiders underwater. The primary prey items eaten were mussels and urchins which varied in, 1) size, 2) energy content of digestible components, 3) handling time, and 4) digestive processing requirements. During the tidal cycle, current velocity within polynyas can increase up to 1.5 m/s. We show that increasing tidal velocity lengthened the travel time to foraging patches and increased surface swimming requirements, therefore increasing the energetic costs of foraging. As tidal velocity increased, Common Eiders increasingly dove directly into the current beneath the ice edge, and at very high tidal velocities they hauled out of the water to sit on the ice. We discuss how strong environmental constraints will narrow the set of foraging strategies that will allow Common Eiders to meet their energy requirements, and outline future research directions to incorporate and test predictions of foraging theory in identifying viable strategies for overwinter survival.

DISCIPLINE: Ecology.

FIELDWORK LOCATION: Belcher Islands, Nunavut.

02-071 **REYES, A.V., CLAGUE, J.J., WALKER, L. and KOCH, J. (2002).** Neoglaciation at Plug Creek, St. Elias Mountains, Yukon Territory. Presentation, 17th Biennial Meeting of the American Quaternary Association, Anchorage, Alaska, August 8-11, 2002.

ABSTRACT/DESCRIPTION:

Geomorphic, sedimentological, and geobotanical evidence provide insight into the Neoglacial history of the Plug Creek area in the St. Elias Mountains of southwest Yukon. Four end moraines deposited by Plug Glacier during Little Ice Age and possibly earlier Neoglacial advances were discriminated on the basis of lichen (*Rhizocarpon spp.*) size. Packages of laminated silt and clayey silt exposed in six pits and one core record lacustrine sedimentation in the valley of Plug Creek upstream of the glacier. Downstream of the glacier, two flood terraces, composed of cobbles and boulders, are separated by a steep scarp and support lichen communities of significantly different age. Our observations suggest that Plug Glacier blocked Plug Creek and impounded a lake that drained catastrophically at least twice during the late Holocene. Forthcoming radiocarbon ages on peat beds separating lacustrine units will help date glacier advances and associated ice-dammed lake events.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: St. Elias Mountains, Yukon.

02-072 ANTONIADES, D., DOUGLAS, M.S. V. and SMOL, J.P. (2002). Establishing baseline chemical and biological conditions in high arctic lakes and ponds: Laying the foundation for future biomonitoring of environmental change in Canada's High Arctic. Poster presentation, 22nd International North American Lake Management Society Conference, Anchorage, Alaska, October 30 - November 1, 2002.

ABSTRACT/DESCRIPTION:
The High Arctic has been shown to be highly sensitive to recent environmental changes, and as such is recognized as an important indicator of changing global environments. However, the significance of modem environmental change in the High Arctic cannot be understood without knowledge of baseline conditions and natural variability in these ecosystems. To this end, we have sampled the modem chemical and biological characteristics of 89 lakes and ponds from three study areas in the Canadian High Arctic: Alert, Ellesmere Island, Isachsen, Ellef Ringnes Island and Mould Bay, Prince Patrick Island. By analyzing the variability in water chemistry between sites and comparing it to diatom species distributions we are establishing the autecology of diatom species present in high arctic regions. Principal Components Analysis (PCA) of water chemistry indicated that at all three sites, variability in water chemistry is controlled by conductivity and related variables, and by nutrients. 343 diatom taxa have been identified during the analysis of surface sediment samples from each site. The distributions of each of these diatom taxa will be related to changes in water chemistry variables. This study forms part of a larger database documenting the temporal and spatial distribution of diatoms across the High Arctic. Because of the high logistical costs involved in monitoring high arctic environments, regular sampling of sites often impossible. The establishment of species environment relationships for diatoms in the Canadian High Arctic will allow for accurate inferences of environmental change to be made even when sites are visited infrequently, and thus forms the foundation of future biomonitoring programs.

DISCIPLINE: Limnology.

FIELDWORK LOCATION: Ellesmere Island, Ellef Ringnes Island and Prince Patrick Island, Nunavut.

02-073 ANTONIADES, D., DOUGLAS, M.S.V. and SMOL, J.P. (2002). Paleoenvironmental change inferred from the diatom sedimentary record at Alert, Ellesmere Island, Nunavut. Poster Presentation, Geological Society of America Annual Meeting, Denver, Colorado, October 27-30, 2002.

ABSTRACT/DESCRIPTION:
The Canadian High Arctic is recognized as an important reference area for the study of global environmental change. Despite this, little or no historical climate data exist from across this large region. This missing climate information can, however, be inferred through the development of paleolimnological proxy records using bioindicators such as diatoms. Alert (82° 30'N, 62° 20' W),

the northernmost human settlement on the planet, is situated on the northeastern coast of Ellesmere Island. It is the site of a Canadian military base as well as a weather station of the Meteorological Service of Canada. In an effort to understand the natural limnological conditions of the area and the effects of environmental change on local water bodies, 30 freshwater sites surrounding Alert were sampled in July and August, 2000 for detailed analysis of water chemistry and diatom assemblages. Self Pond is a small (-0.3 km2), alkaline (pH = 8.3) lake located 8 km southeast of Alert (82° 26'N, 32° 01'W). A 16 cm gravity core was extracted from the deepest part of the lake, and analyzed for diatom relative abundances. Changes identified in the diatom record were correlated to lithological changes in the sediment core. Throughout much of the history of the sediment core, the diatom assemblage was dominated (i.e. > 90% relative abundance) by the small, benthic diatom *Fragilaria pinnata* Ehrenberg, which is typical of cold arctic lakes with persistent or prolonged ice covers. In the upper 2 cm of sediments, a change from grey inorganic clays to darker organic sediments was accompanied by lower abundances of *F. pinnata*, and their replacement by a more diverse assemblage containing other Fragilaria species as well as several other genera. In the upper 0.5 cm of the core, a dramatic decline of *F. pinnata* occurred, replaced largely by *Achnanthes kriegeri* Krasske. Similar striking changes in diatom sedimentary records have been observed further south on Ellesmere Island, as well as on Ellef Ringnes Island to the southwest, and in other high arctic regions. These changes are correlated to those found in other proxy indicators around the circumpolar Arctic, and appear to be indicative of a recent warming trend in the region. These data suggest that a similar, recent warming has occurred on northern Ellesmere Island, which resulted in a dramatic change in lake ecology.

DISCIPLINE: Paleolimnology.

FIELDWORK LOCATION: Alert, Ellesmere Island, Nunavut.

02-074 **FRIESEN, M.T. and BETTS, M.W. (2002).** Archaeofaunas and architecture: Zooarchaeological variability within an Inuit semi-subterranean house, Arctic Canada. Poster Presentation, 9th Conference of the International Council of Archaeozoology, University of Durham, Durham, UK, August 23-28, 2002.

ABSTRACT/DESCRIPTION:

Across the North American Arctic, many ethnographically described Inuit groups lived in substantial semi-subterranean houses during the winter. While these houses are among the most common contexts excavated by arctic archaeologists, the activities carried out in what are assumed to be functionally different parts of the houses are not fully understood. In this paper, we will interpret the abundant and well-preserved faunal samples from a complex pre-contact semi-subterranean house at the Cache Point site, Mackenzie River Delta, northwestern-most Canada. This site was occupied about 700 years ago by Inuit who relied on beluga whales for a large proportion of their diet, but who also acquired a wide variety of fish, bird, and terrestrial mammal species. Within this house, at least six areas can be differentiated: the rear bench, floor, "kitchen" alcove, entrance tunnel, midden, and storage cache. Ultimately, zooarchaeological data in the form of species frequencies, element distributions, and bone modification in each of these contexts will be used to test the validity of ethnographically derived models of Inuit household organization, as manifested in house architecture.

DISCIPLINE: Archaeology

FIELDWORK LOCATION: Richards Island, Northwest Territories.

02-075 **LAYTON-MATTHEWS, D., PETER, J.M., SCOTT, S.D. and PARADIS, S. (2002).** Distribution of Se in massive sulfides of the Wolverine Zn-Pb-Cu-Ag-Au-volcanic-hosted massive sulfide deposit, Finlayson Lake District, Yukon, Canada. Poster Presentation, Mineralogical Association of Canada, University of Saskatchewan, Saskatoon, Saskatchewan, May 27-29, 2002.

ABSTRACT/DESCRIPTION:
The Wolverine polymetallic deposit is in the Finalyson Lake volcanic-hosted massive sulfide (VHMS) district (Figure 1) and contains a resource of 6,237,000 tons grading 12.66% zinc, 1.33% copper, 1.55% lead, 370.9g/t silver and 1.76 g/t gold. In addition to high precious metal concentrations, Wolverine is one of a few VHMS deposits worldwide with high Se-contents (>6000ppm) within the massive sulfides. Initial mineralogical investigations at Wolverine identified the lead-copper-antimony sulfide meneghinite and recognized selenium (Se) substitution for sulfur int he mineral lattice. Furthermore, investigation of test wt% in sphalerite, 0.047 wt% in pyrite and up to 11.2 wt% in galena. The distribution of Se in concentrates suggest a correlation of Se with Pb sulfides; however, such a correlation is in marked contrast to all high Se zones of other VHMS deposits, where Se correlates positively with Cu. The purpose of this research is clarifying the distribution of Se on a deposit mineral scale.

DISCIPLINE: Geology.

FIELDWORK LOCATION: Wolverine Lake, Yukon.

02-076 **LIM, D.S.S. and DOUGLAS, M.S.V. (2002).** Limnological survey of lakes and ponds from a high latitude impact crater site (Haughton Crater, Devon Island, Nunavut). Poster Presentation, 22nd International North American Lake Management Society Conference. Anchorage, Alaska, October 30 - November 1, 2002.

ABSTRACT/DESCRIPTION:
Sustained monitoring of the Canadian High Arctic remains a challenge due to financial and logistical constraints, and as such ecological baseline data throughout many areas of this region remain sparse. The opious lakes and ponds found throughout the High Arctic can provide a means to establish monitoring programs by acting as platforms from which to carry out climate-freshwater system interactions. In this study we present an overview of limnological data from 22 lakes (depth > 2m) and ponds (depth < 2m) in the Haughton Crater region of Devon Island, Nunavut. Lakes and ponds were investigated through chemical and multivariate statistical methods as part of a planned

long-term monitoring program in the Crater area. Study sites were located both within and around the vicinity of Haughton Crater. Haughton Crater is one of the highest latitude terrestrial impact craters, and represents an unusual geological setting in the high arctic. More specifically, lakes and ponds within the crater lying in close association with impact generated carbonate melt rocks and related selenite (CaSO4 - H2O) formations have led to the creation of some limnologically unique aquatic environments. Overall, however, the aquatic systems in this study are ultra-oligotrophic, and based on nutrient ratio analyses are mostly P-limited. Principal components analysis (PCA), used to explore patterns of variation in the limnological dataset, identified conductivity and nutrient levels along Axis 1, and metal concentrations along Axis 2 as the dominant environmental gradients.

DISCIPLINE: Limnology.

FIELDWORK LOCATION: Haughton Crater, Devon Island, Nunavut.

02-077 LIM, D. S. S. and DOUGLAS, M.S.V. (2002). Paleolimnological investigation of lakes and ponds on Banks Island, N.W.T., Canadian High Arctic. Poster Presentation, Geological Society of America Annual Meeting, Denver, Colorado, October 27 - 30, 2002.

ABSTRACT/DESCRIPTION:
The Canadian High Arctic is a distinct region of our planet, and with the need to better understand the far reaching effects of high arctic climate change, comes the demand for continued long-term monitoring of the High Arctic. However, this is a difficult region to monitor on a frequent basis due to financial and logistical constraints, and relatively little ecological baseline data exists for many areas throughout the High Arctic. The situation is slowly being rectified through limnological and paleolimnological investigations that allow for the acquisition of both baseline and historical limnic data from the myriad of lakes (depth>2m) and ponds (depth<2m) that dot the landscape of the High Arctic. Lake and pond sediments preserve many biological indicators that can serve as proxy indicators of past environmental changes. More specifically, in the oligotrophic lakes and ponds of the High Arctic, diatoms (class Bacillariophyceae) often are a significant part of the algal community. Their fossilized siliceous remains are used as bioindicators in our investigations of past physical and chemical limnic conditions. (←/→) This study focuses on the development of a calibration set for Banks Island, N.W.T., and the application of this environmental reconstruction model to 3 lacustrine cores from Banks Island. (/→).

DISCIPLINE: Paleolimnology

FIELDWORK LOCATION: Banks Island, Northwest Territories.

02-078 LIM, D.S.S. DOUGLAS, M.S.V. and SMOL, J.P.(2002). Freshwater diatom paleoecology of Banks Island, N.W. T., Canadian High Arctic. Poster Presentation, 32nd Arctic Workshop. Boulder, Colorado, March 14-17, 2002.

ABSTRACT/DESCRIPTION:
A total of forty-six lakes and ponds were sampled on foot and via helicopter throughout Banks Island over a three and a half week period. These sites wer selected in order to cover as wide an environmental gradient as possible (e.g. proximity to sea, altitude, size, drainage characteristics, etc.). While all sites were sampled for both abiotic and biotic limnological components, only 36 sites of the entire sample set were appropriate for surface sediment diatom collections, and are herein described and analyzed in this poster presentation. Of this subset of sites, nine were lakes, and the remaining 27 were ponds (maximum depth <2m). Although over 250 diatom species were identified from the surface sediments, only those taxa that had a relative abundance of >_ 1% in a minimum of three sites were included in the ordination analysis/calibration set construction. The dominant diatom species identified were pennate and benthic, which is typical for high latitude oligotrophic lakes and ponds. Overall, compared to other previously investigated high arctic islands such as Bathurst Island (Lim et al. 2001), the limnology and diatom community composition of the sampled sites on Banks Island are much more diverse, most likely as a result of the varied elevation, vegetation and surficial material across the island. Preliminary Canonical Correspondence Analysis (CCA) results indicate that the first two axes of the ordination captured 28.1% of the cumulative diatom-environment relation, however this value is expected to increase as further analyses are conducted to identify the key limnological drivers for the diatom species distribution. Overall, it appears that Axis 1 of the CCA is most strongly driven by temperature (TEMP), conductivity (COND), DOC/DIC and chlorophyll a (uncorrected) (CHLA-U) concentrations. Axis 2 represents an ionic gradient, driven primarily by Al+, Fe 3+ and Zn+. These CCA data will comprise the foundation of the calibration set construction for Banks Island. Core findings from site BK-AH show a shift in from greater diatom diversity between 0-7cm to a dominance of Fragilaria brevistriata, Fragilaria pinnata, and Fragilaria construens throughout the remainder of the core (7-34cm). Although all three Fragilaria species are present throughout the core, their presence significantly (R=0.84) increases downcore, while overall diatom species diversity decreases from top to bottom. Douglas et al. (1994) and Lim et al. (2001) identified F. pinnata and F. construens as being associated with deeper, colder, more oligotrophic sites, thereby indicating that a potential shift in nutrient and temperature regimes from less to more nutrient rich conditions relative to its past state may have occurred in the Banks Island lake. This hypothesis will be refined once the calibration set is constructed and applied to the core stratigraphy.

DISCIPLINE: Paleolimnology.

FIELDWORK LOCATION: Banks Island, Northwest Territories.

02-079 RYAN, K. A. (2002). "A late Dorset semi-subterranean structure from the Bell Site (NiNg-2), Ekalluk River, Victoria Island". Etudes/Inuit/Studies, 27(1-2):91-110.

ABSTRACT/DESCRIPTION:
This presentation details the architecture of a Late Dorset semi-subterranean structure excavated in 2002 at the Bell site (NiNg-2), southeastern Victoria Island. The goals of this excavation were

twofold; to better understand the nature of the Late Dorset occupation along the Ekalluk River, and to provide data for a new approach to interpreting stylistic variability in architectural remains. This second objective forms the main focus of my doctoral dissertation, where I plan to use the concept of chain operatoire, or operational sequence, to identify which factors, including social, environmental, and economic, contributed to the architectural variability previously reported for the Late Dorset period. This presentation will provide a preliminary overview of the Bell site excavations, an assessment of the position of the structure within the Late Dorset sphere, and offer some insights into the value of chain operatoire for the interpretation of architectural remains.

DISCIPLINE: Archaeology.

FIELDWORK LOCATION: Cambridge Bay, Nunavut.

TRENT UNIVERSITY

02-080 **GRAHAM, K.A.R., and NOL, E. (2002).** Climate fluctuations: Will they reduce Semipalmated Plover Populations in the Canadian Sub-Arctic? Poster Presentation, British Ornithologists: Union Annual Conference, Climate Change and Coastal Birds, Hull, Yorkshire, UK, March 22-24.

ABSTRACT/DESCRIPTION:
The population of Semipalmated Plovers, *Charadrius semipalmatus*, breeding in Churchill Manitoba, Canada has been studied since 1987. During the study period, several severe climate fluctuations have occurred. The effects of daily and seasonal variation in temperature, and degree-days, on adult body condition, onset of breeding, reproductive outcome, and the breeding population size were examined. Adult body condition significantly increased with mean and maximum air temperatures taken on the day before weighing, however the predictive values of these relationships were extremely low. Similarly, body condition varied significantly with the number of degree-days on the day previous to weighing. Both the first and average incubation initiation dates were negatively affected by temperature, and accumulated degree-days, occurring earlier in years with higher air temperatures, and accumulated degree-days, early in the breeding season. Neither temperatures early in the breeding season, nor during incubation affected hatching success. Average minimum temperature early in the breeding season weakly predicted the size of the local breeding population. There was no effect of incubation period temperature on the size of the breeding population in the subsequent year.

DISCIPLINE: Ecology.

FIELDWORK LOCATION: Churchill, Manitoba.

02-081 **GRAHAM, K.A.R., and NOL, E. (2002).** Do climate fluctuations reduce the breeding populations of Semipalmated Plovers? Presentation, North American Ornithological Conference, New Orleans, Louisiana, September 25, 2002.

ABSTRACT/DESCRIPTION:
The frequency and intensity of climate fluctuations are expected to increase with climate change, especially at northern latitudes. Since 1987 the population of Semipalmated Plovers, *Charadrius semipalmatus*, breeding in Churchill, Manitoba has been studied. During this time several severe climate fluctuations have occurred, making this population ideal to examine the effects of climate fluctuations on the timing and success of reproduction. Because of the large number of climate and nesting variables, a redundancy analysis was used. 80.9% of the variance in nesting variables between years was explained by the early breeding season climate variables entered. However, neither the test of the first or all axes was significant, probably because of the small number of years (12) in the analysis. The analysis was also sensitive to the removal of a single year of data, which was expected because of the large fluctuation in climate between years. Four climate variables (minimum temperature, number of days with northerly wind, amount of rainfall, and wind speed) were identified through the redundancy analysis, as having the most significant effect on the nesting

variables. Timing of breeding was significantly affected by these identified variables. None of the other nesting variables (mean clutch size, clutch hatching success, hatchability and population size) were significantly affected by these environmental variables.

DISCIPLINE: Ecology.

FIELDWORK LOCATION: Churchill, Manitoba.

UNIVERSITY OF NORTHERN BRITISH COLUMBIA

02-082 SHERRY, E.E. (2002). Constructing partnership: A Delphi study of shared resource management in the North Yukon. Unpublished Ph.D. dissertation, Ecosystem Science and Management, University of Northern British-Columbia, Prince George, British Columbia, Canada.

ABSTRACT/DESCRIPTION:

Shared resource management (SRM) offers an important approach for future stewardship of resources and is intended to blend Aboriginal and government approaches, gain greater Aboriginal community support, and enhance the effectiveness of numerous resource management functions. Innovative methods are needed to achieve and advance the ambitious goals of power-sharing, equity, and the integration of knowledge inherent in SRM. The goals of the present study were to develop and test a method for First Nation people and government resource managers to explore the characteristics of effective SRM and to identify its essential elements for the North Yukon. A standard Delphi method was modified to specifically accommodate communication among Vuntut Gwitchin experts, Yukon government experts, and federal government experts. This dissertation examines the essential elements of SRM revealed by the modified Delphi method, the effectiveness of this new group interaction technique, its impacts on participants, and the key characteristics that contributed to its success. The modified Delphi method succeeded in engendering participation, in facilitating cross-cultural communication among diverse experts in remote locations, and in generating critical, structured thinking about a complex, common problem. Characteristics of the approach that contributed to these accomplishments included expert selection and motivation, communication adaptations, conflict management, and maintenance of a positive group climate. Participating experts experienced social learning, empowerment, and personal and professional change. Eleven essential elements of north Yukon SRM were identified, namely: a community-based approach to SRM; development of a common SRM vision and shared goals; skilled facilitation of a SRM group; partnership building efforts; elimination of cultural biases and stereotypes; effective communication among SRM partners; involvement of effective Aboriginal and government representatives; collaboration among government agencies and First Nations to collect, understand, and store knowledge and information related to science-based resource management and traditional environmental knowledge and management systems; using all available knowledge and information to make SRM decisions; development and use of effective SRM communication methods and mediums; and fulfilling the communication requirements of SRM. Findings in this research suggest that the modified Delphi method may have relevant application in other SRM settings and cultural contexts, as well as to broader cross-cultural issues.

DISCIPLINE: Resource Management.

FIELDWORK LOCATION: Whitehorse and Old Crow, Yukon.

UNIVERSITÉ DU QUEBÉC à MONTRÉAL

02-083 HARDY, F. (2002). New quaternary stratigraphic evidences in the Thelon River Basin, Northwest Territories. Rapport de recherches en cours de la Commission Géologique du Canada, juin 2002.

RESUME/DESCRIPTION:
Une expédition en canot fut réalisée dans la Haute Vallée de la rivière Thelon. La documentation de la stratigraphie quaternaire des unités précédant et succédant le dernier épisode glaciaire fut le principal objectif de cette campagne de terrain. Plusieurs coupes on révélé la présence d'unde unité non-glaciaire plus ancienne que l'Episode Wisconsin. Par endroits, cette unité montre une succession de paléosols faiblement développés, alors que cette même unité montre, à une autre coupe, son origine franchement fluviatile. Cette unité stratigraphiquement positionnée entre deux t'ils pourrait être corrélée à l'épisode interglaciaire Sangamon. Un programme de datation par luminescence est en cours dans le but d'établir le cadre. Des plages soulevées, associées à un lac glaciaire barré par la calotte glaciaire Keewatin au tardiglaciaire dans le basin de la rivière Thelon, on été échantillonnées pour établir le taux retrair glaciaire de cette partie des Territoires du Nord-Ouest.

DISCIPLINE: Sciences de la terre.

LIEU DU TRAVAIL SUR LE TERRAIN: Territoires du Nord-Ouest, vallée de la rivière Thelon.

02-084 CADERON, J.H., BEDARD, N., GOULET, N., and MADORE, L. (2002). "Archean ultrahigh temperature granulite in a sapphirine-bearing metasediment, Northeastern Superior Province, Québec, Canada". Journal of Metamorphic Geology, February 2002.

ABSTRACT/DESCRIPTION:
The Minto sub-province occupies the northeastern corner of the Archaean Superior Province in Québec and is subdivided into a number of lotho-techtonic domains. It is dominated by deformed felsic plutonic rocks in which are embedded volcano-sedimentary slivers. The Douglas-Harbour Domain is composed of a tonalite-trondhjemite complex (Faribault-Thury), into which are emplaced two 2740-2726 Ma enderbitic complexes (Troie and Qimussinguat). Slivers and enclaves of volcano-sedimentary rocks in the Troie Complex are metamorphosed to the granulite grade and record a complex tectonic history. An igneous breccia situated in the core of the Troie Complex contains an heterogeneous clasts population. One metasedimentary clast contanis as assemblage of sapphirine + sillimanite + plagioclase + spinel + cordierite +/- quartz. Sapphirine occurs as symplectitic rims with plagioclase around sillimanite and/or with K-feldspar. It forms coronas around spinel, with K-feldspar rimming sapphirine. These textures imply prograde polygranulite metamorphism. The sapphirine-spinel thermometer calibrated by Owen (1991) yeils temperatures of 780-922 +/- 100°C. The spinel-codierite thermometer calibrated by Vielzeuf (1983) yields the highest temperatures, 932-1111°C. Biotite-corderite and biotite-spinel thermometers using the thermodynamic data of Berman (1991) give temperatures of 780-875 +/- 500°C respectively. Pressure estimates based on Berman's (1991) data using the spinel-coderite-biotite-quartz assemblage suggest pressures between 12 and 17 =/- 0.5 kbar. These results suggest an ultra-high

temperature/isothermal decompression (UHT-ITD) P-T path similar to that of others Archaean terranes. A first granulite metamorphic episode (MG1) is related to burial of metasediments, generated spinel and millimanite, and represents the protolith to formation of sapphirine and cordierite during a period of UHT metamorphism (MG2) which is probably related to generation and intrusion of high-temperature (1100°C) enderbites. The entire massif then rose up to its final emplacement pressure of 5 kbar in response to buoyancy forces.

DISCIPLINE: Metamorphic geology.

FIELDWORK LOCATION: Northern Québec.

02-085 SURETTE, C.(2002). Comment concilier les exigences de la science et la recherche participative pour des recherches interdisciplinaires en environnement? Rapport de synthèse, doctorat en sciences de l'environnement, Univeristé du Québec à Montréal..

RÉSUMÉ/DESCRIPTION:
Cette synthèse environnementale aborde la question de comment concilier la recherche participative et les exigences de la science pour des recherches environnementales interdisciplinaires. Pour y répondre, une définition de la science et de ses exigences est d'abord élaborée a partir des définirions épistémologiques de la science. L'objectivité, la méthode scientifique, la distanciation intellectuelle et l'utilisation d'un language propre sont discutées. Une critique de la culture scientifique et de son caractère normatif suit. La recherche participative est ensuite discutée en se basant sur les écrits des sciences humaines et a partir de 1'approche écosystèmique en santé humaine. Les différences et les similitudes entre les deux types de recherches (scientifique et participative) sont ensuite apportées, en se penchant sur le contexte culturel, la spécificité, les objectifs de recherche et les méthodes. A travers des exemples de recherches participatives en sciences environnementales, on verra ensuite comment il est possible de concilier les exigences de la recherche participative et la recherche scientifique conventionnelle. La complémentarité des approches, le plus-value de l'apport des communautés a la qualité de la recherche scientifique et le caractère interdisciplinaire des sciences de l'environnement émergeront de la discussion.

DISCIPLINE: Sciences de 1'environnement.

LIEU DU TRAVAIL SUR LE TERRAIN: Labrador, Baie James.

02-086 **BASTIEN, J.; SEGLENIEKS, F. and SOULIS, E.D. (2002).** The use of volumetric soil moisture and soil characteristics for the calibration and validation of the WATCLASS model for pasture fields in Southern Ontario. Presentation, Canadian Geophysical Union Annual Meeting , Banff, Alberta, May 2002.

ABSTRACT/DESCRIPTION:
The WATCLASS model is a distributed hydrologic model that includes a detailed simulation of the energy and water balances within a watershed. The algorithms include a physically-based soil water budget. The majority of the hydrologic calibration and validation of the WATCLASS model has involved streamflow. This paper presents a comparison of the volumetric soil moisture estimated by WATCLASS with field observations. The field data were obtained during a RADARSAT/Soil Moisture experiment conducted by the Civil Engineering Department of the University of Waterloo. The volumetric soil moisture of the top 10cm soil layer was determined for seventeen (17) pasture fields located within the Waterloo-Kitchener-Guelph region for a variety of days in the fall of 1996 and in the summer of 1997. The number of days of observed data ranged from eleven (11) to thirteen (13) days. WATCLASS was run for a two-year period beginning January 1, 1996, forced by gridded meteorological observations at a grid spacing of 10km. Volumetric soil moisture values for the low vegetation class were compared with observed values. Various temporal averages of the WATCLASS volumetric soil moisture estimates were used. The daily average volumetric soil moisture values estimated by WATCLASS compare most favourably to the instantaneous field measurements. In general, the partial correlation coefficient is not significantly different that 1.0. However, the model typically underestimates the volumetric soil moisture by approximately 0.06 to 0.10.

DISCIPLINE: Civil Engineering, Hydrology.

FIELDWORK LOCATION: Wolf Creek, Yukon Territory.

02-087 **LEMELIN, R.H. (2002).** Conservation strategies in North American bear viewing areas. Poster Presentation, Leisure Research Symposium, University of Waterloo, Waterloo, Ontario, May 3-4, 2002.

ABSTRACT/DESCRIPTION:
Areas where bears are predictably known to congregate such as near Churchill, Manitoba (*Ursus maritimus* - polar bears) and Knight Inlet British Columbia (*Ursus arctos* - brown bears) have become popular tourist destinations. In the US alone, the gross economic value for bear viewing was estimated at US$485 million (Neary 1995: Workshop for Bear Viewing Area Managers). The growth of the bear viewing industry has increased bear-human interaction, resulting in food conditioning, conflict and habituation. The ways in which bears have responded to the increased presence of humans have implications for current management systems. Through a comparative analysis of two bear viewing areas in North America, I will examine both common and site specific management

issues. I suggest that current wildlife management strategies developed to protect bear populations are effective and provide a quality experience for tourists. However, under changing conditions (e.g. increased tourist activities, demands and expectations) it is necessary to identify common issues in a variety of socio-economic contexts, so that new directions for management strategies can be justified and developed.

DISCIPLINE: Wildlife Management.

FIELDWORK LOCATION: Knight Inlet, British-Columbia and Churchill, Manitoba.

02-088 MARTEL, E. (2002). The Yellowknife Greenstone Belt: A review of its stratigraphy and geometry, Slave Province, NWT, with emphasis on the Banting Group. Talk, Geoscience Forum, Yellowknife, Northwest Territories November 21, 2002.

ABSTRACT/DESCRIPTION:
The Yellowknife greenstone belt has been extensively studied since it was first mapped by Jolliffe (1942). The interpretation of stratigraphic relations among the units has evolved considerably (e.g. Jolliffe, 1942; Boyle, 1961; Henderson and Brown, 1966; Helmstaedt and Padgham 1986). Recent field observations shed new lights on some of the stratigraphic relations.
The stratigraphic relations between the Banting Group and the Walsh and Burwash formations have been a subject of debate. Two major interpretations have been proposed to explain the present geometry, which consists of two packages of felsic volcanic rocks with sedimentary rocks (Walsh Formation) in between: 1) the two felsic packages represents two opposing limbs on a syncline with the Walsh Formation in the core; 2) the sequence is an homoclinal sequence, east facing one with two cycles of felsic volcanism. Contrary to previous observations, the Walsh Formation is present both to the west and east of the Prosperous Formation and not only between the two Banting formations. We believe that the systematic repetition of the stratigraphy (Banting-Walsh-Banting-Walsh-Burwash) and the presence of ubiquitous sulfide-rich deformation zones along each contact result from either early tectonic juxtaposition (D1 or pre-D1?)or transportation and/or fold repetition (D2 and D3).

DISCIPLINE: Structural Geology.

FIELDWORK LOCATION: Yellowknife, Northwest Territories.

02-089 MCCREANOR, L. (2002). Organochlorines in the Western James Bay Region. Poster Presentation, 2002 Graduate Student Research Conference, University of Waterloo, Waterloo, Ontario April 1-5, 2002.

ABSTRACT/DESCRIPTION:
This research project will examine whether contamination by persistent organic pollutants (POPs) from a mid-Canada Radar Line installation in the Mushkegowuk Territory (Western James Bay) has

penetrated the surrounding aquatic ecosystem. Persistent organic pollutants, which include DDT, PCBs and a number of other toxic substances, have been associated with negative health effects in wildlife and possibly humans. Preliminary reproductive data suggests that there may be health concerns for First Nations people of this area who subsist on wild game. In this study, it is expected that high levels of contaminants, particularly PCBs and DDT, will be found throughout the aquatic food web due to bioaccumulation and long-range transport of these chemicals from other geographic locations. Estimates of contamination in various species of fish will be helpful for the Fort Albany community near this military site, since aquatic species form an important part of the local traditional diet. This will also contribute to the growing number of studies in this region on aquatic food webs and on the human health impacts of POPs, particularly with respect to abandoned military sites along the DEW Line and elsewhere in the Arctic.

DISCIPLINE: Environmental Science.

FIELDWORK LOCATION: Fort Albany, Ontario.

02-090 ONCLIN, C., BEST, K. , BASTIEN, J. and CARTER, T. (2002). Snow Surveys, Fort Simpson area, NT. Internal Report, Aquatic Ecosystem Impacts Research Branch, National Water Research Institute, Environment Canada, Saskatoon, Saskatchewan, 2002.

ABSTRACT/DESCRIPTION:
This report details 36 snow surveys completed during the period of March 22 to March 25, 2002 in the Fort Simpson, N.W.T. region. Two of the snow surveys were repeated on different days during the study period so that the results could be compared, and any changes to the snow pack detected. (Repeat surveys are labeled with "control" embedded in the survey name). Snow water equivalent (SWE), densities, depths and locations are included for each snow course. Locations are given in NAD27 coordinates. Photographs were taken at some survey sites, but were not included in this report.

DISCIPLINE: Hydrology.

FIELDWORK LOCATION: Fort Simpson, Northwest Territories.

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